VR/FEM/CAD/SaaS VR-Cloud® UC-win/Road

UC-win/Road Ver.10

3D-Real time Virtual Reality

Information Modeling & Virtual Reality

VR-Cloud®

3D・VR Cloud

CONTENTS

FORUM8®

3D real time/virtual reality software UC-win/Road awarded Software Product of the Year, 2002.
Advanced software that enables the creation of large scale 3D spaces for all sorts of projects by PC operations and with which you can give variety of presentations in real-time. It can be used as an ideal software in a flexible development environment and for advanced system development.

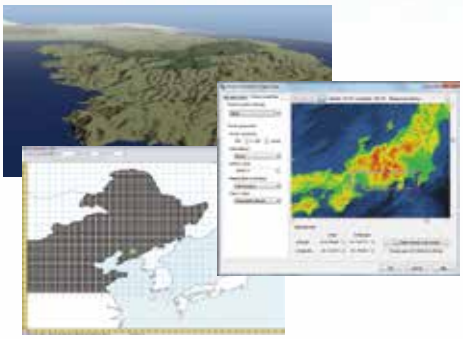
2002 SOFTIC SOFTWARE PRODUCTS OF THE YEAR WINNER

3D Virtual Reality (hereafter, VR) environment that covers the terrain and seabed features of this world can be created easily in a short amount of time.
Various VR environments and models including FBX models can be downloaded from the FORUM8 Web Server DB. The software supports the import/export of BIM data in IFC/Shape/LandXML format. Equipped with an ability to generate road alignments, cross sections, terrain, and the ability to position models and assign traffic and generate traffic movement within VR space; the software can help you give a real-time presentation for comparing design alternatives and stakeholder consultation as the Visual Options tools and presentation features will do all the tricks. As various types of high-level real-time simulation including driving simulation, daylight simulation, and traffic simulation are feasible, the software makes the lives of all engineers engaged in the work of design, development, and research easier. The ability to run all types of simulation including driving simulation, day and night simulation, and traffic simulation with a high degree of realism significantly helps the design, research, and development work of all engineers. VR-Cloud® that hosts 3D VR environment on our cloud server expands the world of engineering infinitely as it serves as an ideal 3D platform for reviewing design among all project members online.

Standard Data / CAD Data

Terrain data and map are included on the database. A 50m topographic mesh (of New Zealand and Japan) and 2500 spatial infrastructure data is included. Other useful features include a custom terrain feature, a world geographic coordinate system conversion feature, DXF-XML conversion as well as a 3D and 2D terrain editing feature.

- Geographical Survey Institute Authorisation (2000, #173):
  5m/30m/50m mesh elevation (nationwide) / 2500 spatial infrastructure data (Tokyo / Osaka)
- SRTM(90m mesh)/ ASTER(30m mesh)are avialable
- World geographic coordinate system conversion tool authorisation: (#603, Planning and Coordination Division of the Geographical Survey Institute)



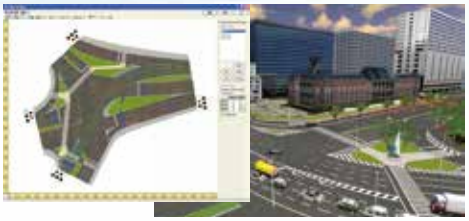
Efficient VR data creation assistance through the use of standard models/textures and an extensive download DB

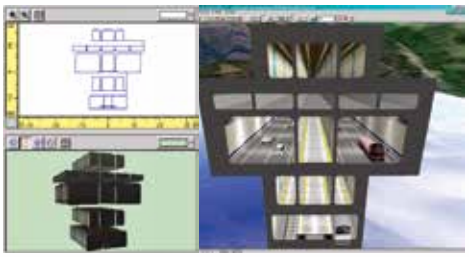
In addition to the standard data including 3D models and textures, extensive downloads are available directly from the UC-win/Road DB on the Internet. Also, useful editing and movement tools are available, allowing scaling up and down, movement, rotation, inclination and arrangement of models. Action setting offers generation and motion control of moving models.

Creating a complicated road is made easy in UC-win/Road

All sorts of lines such as roads, rivers, lakes or flight paths can be set up with parameters or free hand drawing and roads, tunnels, bridges, rivers or walking routes can be automatically created.

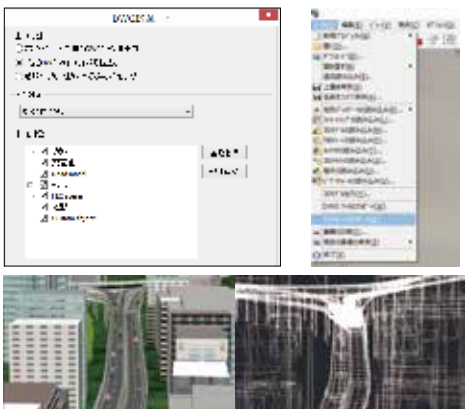
Tunnel and bridge sections are set by the definition of a horizontal road alignment and the vertical alignment.A cross section can be defined very accurately in that cutting and embankment can be processed taking berm into account, not to mention textures can also be assigned. Alignment / cross section generation feature helps you create roads with complicated geometry very easily.





Supports CIM via DWG tool NEW

Makes drawings of VR space model in 3D and supports CIM. Cross section of roads and 3D model are imported from DWG/DXF files. 3DVR models of UC-win/Road are classified according to road, terrain or layer and then exported. The display colors can be set as well.



Large-scale VR support

It's possible to create data from the size of a dice to a 20 kilometer road structure in the same space. Maximum size is 8000 cubic kilometers. Smooth dynamic display is supported by performance settings and 3D trees compatible with dynamic LOD.

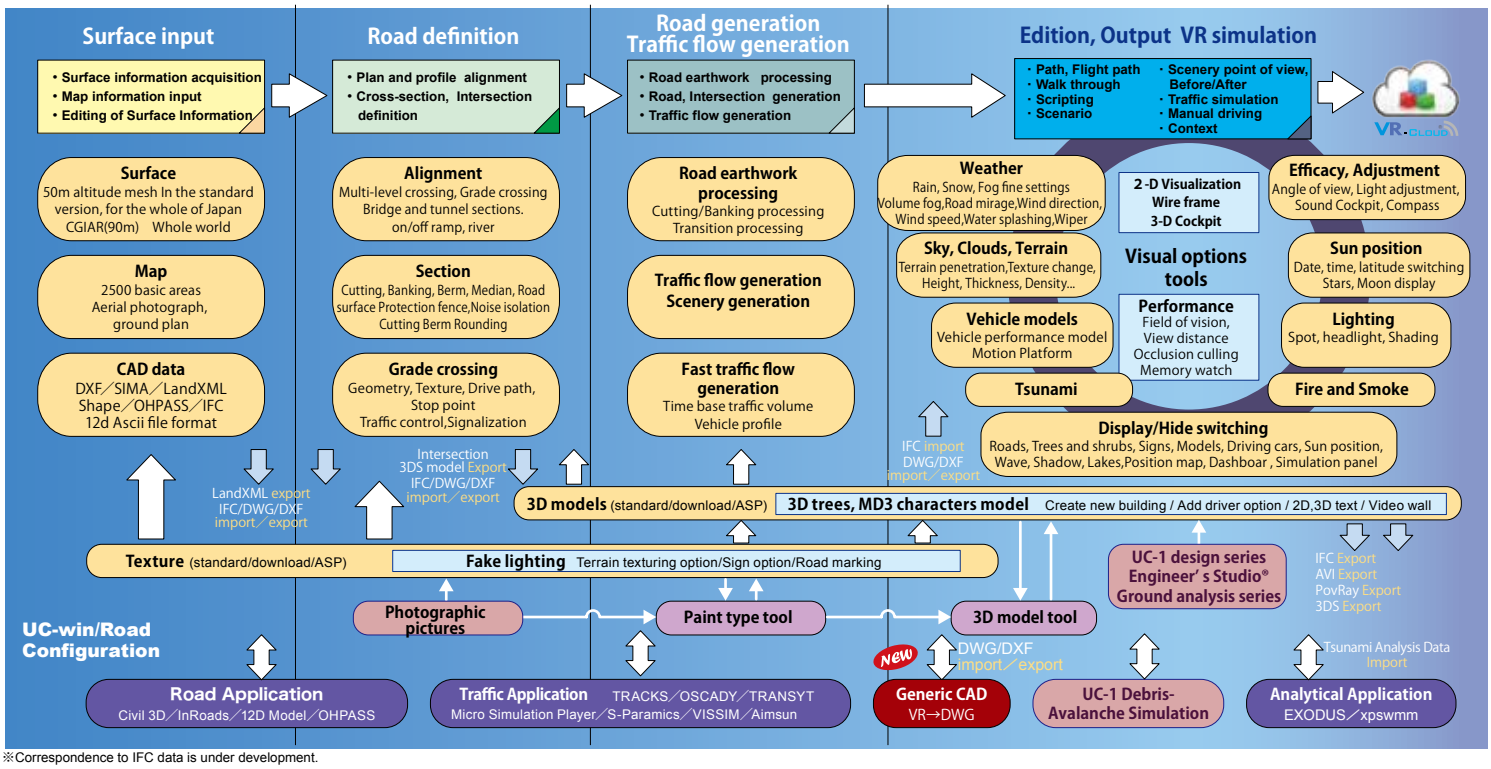
Various displays with the Visual Options Tool. Traffic simulation of road hazards are also available.

Also available are real-time control of time, weather, and lighting. You can display day and night scenes with a range of lighting conditions using the artificial light feature. Generating traffic streams based on traffic volume, vehicle profiles, traffic light configurations, as well as simulating traffic obstructions, disasters and accidents can also be carried out.

Real-time VR operation by simple operations. Helps presenters with Before / After, scripting and manual driving.

UC-win/Road supports several driving modes (speed of car, lane changing, height of viewpoint, viewpoint switching in 8 directions) and dynamic movement of viewpoint (from other cars, up and down, turn head). Automatic flight and walk-throughs are available with the flight path setting (editing in the 3D display is supported). More advanced simulation can be performed with manual driving and support for a 3D cockpit and multi-monitors.

UC-win/Road



※Correspondence to IFC data is under development.

VR-Cloud® Ver.5.2 Ver.UP

Newest release : April 2014

Japanese/English/French available
Registered trademark No.5445551

VR-Cloud® is a consensus building solution which uses 3D and VR on a cloud server. As long as you are connected to the Internet, you can take control of VR space even on a thin client.

Android is now supported!

VR-Cloud® Standard

Option Price：US$3,360

Various kinds of simulation can now be experienced very smoothly by implementing a unique transmission technology "a3S".

VR-Cloud®Collaboration

Option Price：US$5,500

The addition to the Standard Ver. of communication tools, such as the annotation and 3D bulletin board functions, means that we now have a VR Cloud System that makes advanced communication and use of VR between client possible.

Handwritten design meeting can be easily realized.

Case studies of VR-Cloud® Collaboration function

◀Example of design meeting
・Imputing handwritten design on the main screen
・Discussion using video conferencing system (Skype)

▼The viewpoint can be selected freely.

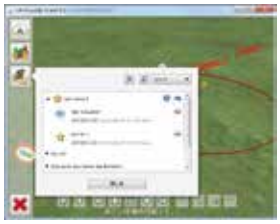
◀Discussion and 3D icon of annotation

Tomohiro Fukuda laboratory of environment and energy engineering, Graduate school of Osaka University

◆**Basic patent granted for virtual space information-processing system.** (Jan.24, 2014)
◆**Patent granted for a3S Cloud Transmission Library** (Sep. 20, 2013)
→ **3DCAD "Rhinoceros" can be linked via a3S, the 3D models can be edited and it can be expressed within Road in real time.**
◆**Basic patent granted for Cloud Management System**(Oct. 25, 2013)
◆**Basic patent granted for driving simulation of 3DVR cloud** (Dec. 22, 2012)

Basic Patent Acquisition

▲Function of landscape evaluation



▲3D bulletin board function

▲Annotation function

▲Photo function

UC-win/Road Main Function

PLAN・DESIGN

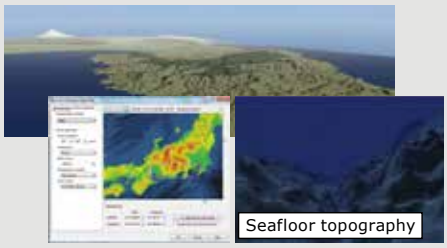
Design Simulation

●Digital map of Geospatial Information Authority of Japan

・50m mesh (elevation)(Approved number: 2000, #173)
・Format of 5m mesh (elevation)

●Geographical features of the world

・The geographical features are enhanced.
・Using the "CGIAR-CSI SRTM 90m Database" for all parts of the world, geographical features of China and Australia are installed in UC-win/Road.
・SRTM(90m mesh)、ASTER(30m mesh)
・BlueMarbleNextGeneration (500m mesh)
(Support the topography of the seabed)
・Highly accurate terrain can be created whilst specifying its resolution.
・The large terrain exceeding 100km in area can now be generated.Z



●Road-Terrain matching process

Deal with terrain matching processing in addition to cutting and banking by road generation.

●Vertical curve of railroad Ver.IAP

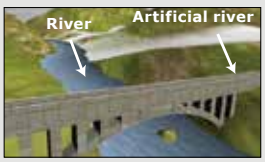
Ability to draw the centerline for railway surveying and the centerline of structure for construction surveying, transition curves and vertical curves, cant of a railway track, railroad switch. Trains can be made to travel over multiple tracks.

Transition Curves: Clothoid, Cubic parabola, Sine half wave length curve

Vertical Curves: Secondary parabola, circular curves.

●River, road cross section

Planar and longitudinal alignment is now possible.



●Transparency of cross sections

Transparency rates of parts are selectable in the cross section editor. Transparency of transparent panels and translucency of a sound insulation wall or balustrade can be expressed easily.

●Improved cuttings and banks and rounding of a small stage

We have improved the setting method of cuttings and banks. It allows the setting of width, angle of slope and textures for each stage of the right side and the left side. The rounding can be set for the berm.

●Generating forests

This feature allows the establishment of up to three types of tree model (per session) and automatic generation of between several hundred and several thousand trees at predefined locations. Collective deletion is also available.

●Enhanced intersection function

More intersection types including rotary and L type are now available for generation. Complicated flat crossing and road signs are supported through 3DS output editing. The improvement realizing for vehicles to run on the model at intersection was added.

●Intersection function

The function to generate road surface texture semi-automatically. It reduces the work load of texture generation work.

●Tool for editing building

Users can create 3D building models in any shape they wish whether it is square, circle, free form, or a combination. It shows the front-back, right-left, height and size and texture of surface for both day and night.

●3D text

Generation and arrangement of 3D text on 3D space are available.

●Video wall and video player

Animation video display including cylindrical screen can be reproduced as 3D object.

●CImprovement of fire and smoke visualization

With this function, you can present various phenomena including fire, bonfires, stream from hot springs and smoke from chimneys. The visualization and movement of smoke and fire inside tunnels is significantly improved.

●Parametric 3D modelingParametric 3D modeling

Sign, stairway, escalator, fence by parametric input can be generated.

In case of stairway, the width, height, number of bars and texture can be assigned.

●FBX 3D model

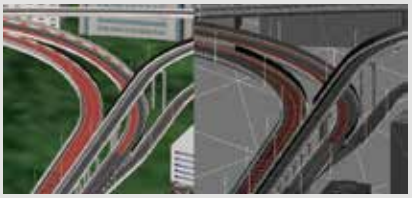
FBX file used for various kinds of models which have high accuracy is now supported. It supports the animation function using bone and allows to set the degree of transparency information and lighting effect and even to import Collada file including SketchUp etc.

●LOD (Level Of Detail) Function

LOD Function is be used in the display of the MD3 Character、3D Model、FBX Scene

●Import / export DWG and DXF NEW

Innovative function supporting CIM
・Import (3D/2D):cross section of roads, models
・Export : by category (model, linear and terrain etc.), whole



●Traffic simulation function Ver.IAP

- Packetization of vehicle
- Setting probability of each route group
- Motion control point in the event transition
- Setting the number of stranded vehicles
- Speed control on traffic flow
- Scenario within an intersection
- Save traffic conditions (Control scenarios / scripts / contexts using traffic snapshot function)
- Improvement of scenario function Vehicle speed, lane(s), speed limit can be dynamically assigned
- Various commands against leading vehicle (can be applied to traffic flow, vehicle within a scenario played by Micro Simulation Player)

●Signal control / Traffic simulation with road Hazards

Traffic simulations based on vehicle performance are supported. It is compatible with various traffic rules, signal control and traffic lane control, and car lights and signal expression in traffic simulation are available.

●Traffic Rules Setting

Traffic rules for Japan, New Zealand, China and Korea are loaded by default and moreover new rules can be added freely.

●Off-Road Function

Users can drive vehicles around the 3D VR space using a steering wheel, a game controller or the keyboard in UC -win/Road.

●Traffic connector

The virtual type which connects between moving nodes can be defined and the traffic movement can be set from edit window of plan view or main menu.

●Vehicle configuration/waypoints

Configuration of driving routes, starting positions, running behind other vehicles (e.g. trains), sound configuration and railroad crossings, by setting action control points, is available.

●Display revolving wheels,steering angle

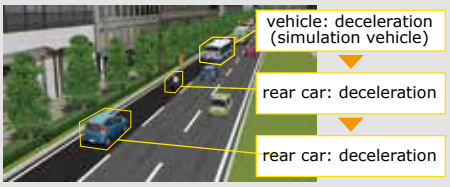
With vehicle plug-in, displaying revolving wheels and the steering angle is possible by defining the front and rear wheels.

●VISSIM

Visualization of traffic analysis reading the result of traffic analysis of VISSIM.

●Interaction function

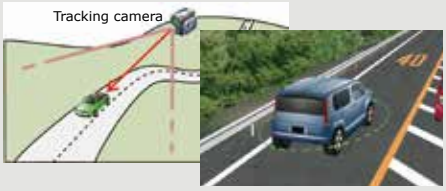
The interference check on the traffic flow and self-vehicle course generated from various traffic analysis softwares, such as VISSIM and S-PARAMICS.(within less than 200m)



●Navigation

Dividing movement mode and simple viewpoint operation clearly, support the viewpoint operation in a movement mode.

Movement mode	Possible viewpoint operation
Free movement	rotation, moving back and forth, horizontal and vertical movement, free flight, satellite movement, jump
Running, Flight, Driving	Rotation, rotation on an axis of object, satellite movement
Walking	rotation, jump
Chasing	rotation centering around object, satellite movement



●Special weather effect and illumination

The function of rain and snow expression is lifelike. Fog, thunder, wiper(Can be operated with the axis of the upper surface of the windshield) and water splashing can specify the execution area.

●Walking simulation

Speed alteration while walking is available. Walking operation with mouse was added.

●Movement of walking crowd Ver.IAP

It's the function which the user can set an area of the 3D environment within which the pedestrians can walk.

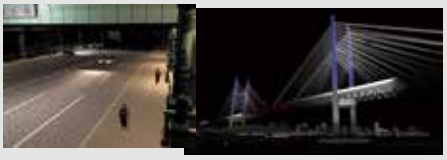
- Start point, destination point, and the average number of pedestrians can all be assigned.
- Different pathway types can be assigned (station, stairs, escalator, etc.).
- Supports link connection (elevator and waiting room).
- Supports profile of multiple pedestrians.
- Ability to search for the shortest pathway.

●Artificial light/Shading

A simulated lighting feature is offered by alternating textures for day and night. It will turn to night texture automatically in tunnel.

●Lighting function

The spot light and head light gunction allows the simulation of night time and lighting. For instance, you can use it for a signal lamp a window lamp in a building or the light of a ehicle.



●Headlight

Can be set individually for each vehicle.
The range and shape forming an area of exposure to right and left headlight of has been optimized, hence it can now be visualized in a much more realistic manner.The ability to switch from low beam to high beam and vice versa. Visualization of light rays from fog lamp, reverse light, and the lights of special vehicles such as heavy-duty vehicles.

●Tunnel lighting function

Setting the color and strength of tunnel lighting is available. The effect is applied to the traffic vehicle going into tunnel and an adjunct of road.

●Context (Environmental conservation)

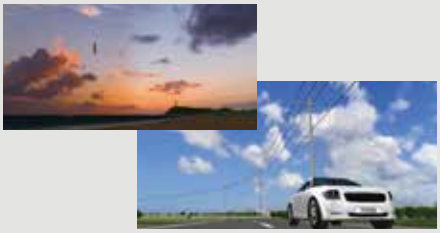
The function which can save various environmental setting in one context and are able to execute context in one click.

●3D stereo display

Passive method which outputs the image to multiple screens with parallax, and Active method which outputs to one screen from side to side using Quadro video tip, produced by NVIDIA are supported. Wide-screen can be available.

●Sky dome function

The Sky dome function is where the sky can be rendered inside of the 3D environment. It is now possible to map various textures on it.



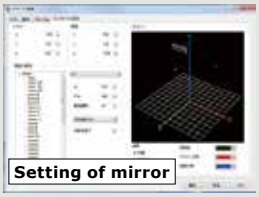
Driving Simulation／Vehicle Research and Development

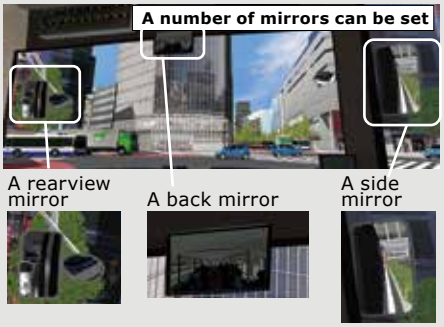
●Manual driving

Support for manual driving as well as traffic flow based on vehicle performance by vehicle type.

●Vehicle cockpit setting

Side mirrors, the rear-view mirror (rear view) and car navigation system (display any view) can be displayed in real time. The cockpit of a large truck and heavy vehicles etc. can be set to the mirrors as many specified parts as you want. View point and view angle of rearview mirror can be adjusted. New mirror can be added.





●Head Tracking NEW

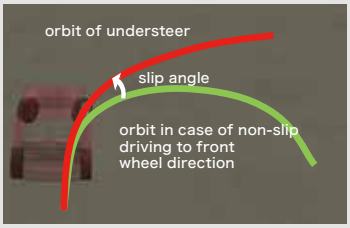
Receive a driver's eye position information while he/she is driving in real-time from sensors such as Kinect, and send that information to UC-win/Road itself.

●Force feedback

Automatic vibration deriving from road material and road shape and constant vibration within the area is transferred to the controller.

●Constitution of vehicle movement model

The expression of more realistic movement is now available by implementing model of overall. vehicle movements, engine and each transmission from engine to wheel.



●Road attribute

Setting the difference of friction coefficient on road surface in every texture is available.

●Function linkage with CarSim

Version 8 is applied to the vehicle movement simulation using the set value of road friction coefficient μ.

●Edge blending Under development

When projecting via several projectors, the screen on the edges between the projectors can be smoothly displayed.

Pitch angle of the projector is also supported.

●Audio system

By employing OpenAL, a variety of surrounding sound, the car's sound (sound of engine tire, wind, tunnel reflection sound) are supported. Lowpass filter is supported.

- Squeal sound (slip sound) and sound reproduction of 4 different wheels are supported.

●Driving simulation function

As vehicle dynamics model that accurately calculates vehicle's physics is included in UC-win/Road, it is possible to perform calculation taking into account the engine, transmission, vehicle weight and center of gravity, tire's frictional coefficient.

- ABS (Anti-lock Braking System) is now supported.
- Dashboard can be displayed
- Significant improvement in that the characteristic of torque converter, which tranfers rotating power from an engine to the transmission, are modeled very precisely in car with an automatic transmission.
- The concept of half clutch control has been added.

●ACC/Automatic driving function NEW

ACC function and self driving function in driving simulation are added. It can switch the manual driving and automatic driving. It also allows to recognize the traffic signals and limited speed. Automatic speed / steering control Brake assist, Superposing display of preceding vehicles' information

●Trailer running function

Cab model and trailer model are set separately, and they are controlled as different models are connected.

Interface

●Full screen, simulation panel
Displaying full screen is possible, without showing the menu and tool bars. Simulation which can customize its panel position and command.

●Universal UI plug-in NEW
Various kinds of contents of images, videos, Web pages etc. can be browsed and searched with intuitive and user-friendly interface via 3D icon.

●2D horizontal plane view

●Unicode
Standard version is available overseas. Chinese limited version corresponds with Chinese language interfaces and traffic rules. It is compatible with user interface (Japanese/English (NZ)/Korean/ French).All languages are available in spite of OS language.

●Video card manufactured by ATI and NVIDIA has been supported.

●3D Navigation (3D mouse)
3D mouse, like "Space Navigator" allow intuitive operation in 3D space.

●Operation via game controller and keyboard is now supported.

Driving Simulation／Vehicle Research and Development

Point-cloud Plug-in
Advanced Version

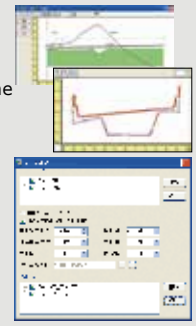
Real time VR supports 70,000,000 point cloud.

- Display of 3D point-cloud data to VR space
- A variety of editing function including creation of horizontal and vertical center line
- Supported point-cloud number 32bit : less than 40,000,000 64bit : more than 70,000,000
- Conversion land and ocean bed into Tin, pasting of the image
- Automatic color assignment for aerial photographs
- Exporting to LandXML

Future development

- Function to create linear will be enhanced. Road centerline is calculated by extracting the white lines.
- Edit function will be enhanced, partial removal and speeding up the point clouds search.
- Speeding up the display via point clouds LOD

●Road cross section/ Road section editor



●Road modeling

▲Point cloud data only

▲Road model

▲Model of traffic intersection in Shibuya

Plug-in for 3D point cloud and post-processed road management report
Option in additional cost

Post-processed road management report can be made by measuring the differences from the design data and the point cloud data.

The difference is measured from the design data (designed value) and the point cloud data (actual measurement value) and each post-processed road management report is created. If the design data has already been maintained with LandXML etc., the post-processed road management report can be made easily by way of acquiring the post-processed road in 3D laser scanning.

▲Retaining wall - Finished cross section

▲Superposition of embankment surface and point cloud data (Retaining wall)

▲ Management report in Excel format (Style 31)

Photo-log point cloud modeling plug-in NEW
Option in additional cost

When there is no color on the point cloud due to the specification of the measuring device, unfavorable condition at the time of measurement, or low accuracy, Photo-Log Point Cloud Modeling Plug-in is the answer as it uses photo-logs to add color to the point cloud data. (Point-Cloud Modeling Plug-in is required at an additional cost)

▲Before coloring ▲After coloring

Rhino plug-in NEW
Option in additional cost

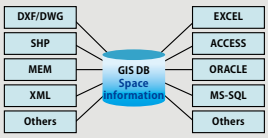
Plug-in that displays 3D models built by Rhinoceros® (Robert McNeel & Associates http://www.en.la.mcneel.com/) within the 3D environment of UC-win/Road.

- Data are transferred back-and-forth between UC-win/Road (server) and Rhinoceros® (client) via a3s; 3D model in the process of being built by Rhinoceros® is reflected in UC-win/Road. Model positioned within the 3D environment can be edited.
- With the combination of VR-Cloud®, Rhinoceros® can be browsed by VR-Cloud® user.

GIS plug-in
Advanced Version

3D GIS system can be built by importing data from road CAD, GIS software, and 3D CAD software.

- Export into Google Earth
- VR model by UC-win/Road Web Viewer is published
- Coordinate conversions for GIS format files
- Import / Export of Image files or Vector files
- Attribute table conversion function
- Linkage between GIS file and UC-win/Road



3D Model Output Plug-in
Advanced Version

This function enables the outputs of all models with geographical features in 3D space of UC-win/Road in an arbitrary 3D model data format. For example, it will be possible to use it with various editors and tools such as 3ds Max by outputting it in 3ds format, (3ds format is the standard).The 3D model output data format is planned to increase to include various formats such as FBX, Obj, VRML and OpenFlight.

UC-win/Road DWG Tool NEW
Option in additional cost

3D/2D data exchange that supports CIM.
(3D Model Export Plug-in is required at an additional cost)

Import: Import into "Road section", "3D model" from DWG data

Export: Roads/terrain within UC-win/Road 3D model are categorized into layers and then exported. Exact colors as seen in UC-win/Road can also be assigned to the exported model.

Parametric modeling plug-in VerUP
Standard Version

Sign, stairway, escalator, fence by parametric input can be generated. In case of stairway, the width, height, number of bars and texture can be assigned. Signs can be grouped and have them displayed at any given timing. For instance, you can have one sign displayed at one time and then disappear to be replaced with another sign at another time.

List of model panel
general model / vehicle / cab / 3D cockpit / road structure / flags / terrain texture / video wall / buildings / rail trailers / traffics / signals / characters / trees / fire and smoke / 3D strings

IFC plug-in
Option in additional cost

- The terrain data in the file described in IFC format can be imported into UC-win/Road as a terrain patch.
- TheUC-win/Road as a terrain patch can be exported into terrain data in the file described in IFC format.

Munsell Colour Space Output Plug-in

Option in additional cost

It is a plug-in to convert the scene displayed on the main screen into the "Munsell colour system", and preserves it in the munsell colour file. It then becomes possible to use this scene for design and research by using the munsell colour file by accessing the file output with the plug-in.

OSCADY PRO Plug-in

Advanced Version

■About OSCADY PRO:OSCADY Pro allows automatic setting of signal phase and arrangement, and optimized signal capacity and congestion, and gradual and swift optimization of traffic signal. To optimize, it automatically set the phase, based on the signal phase and timing of signal changing cycle.

▼Import maximum capacity and minimum delay

▲Intersection figure

Developed by TRL (http://www.trl.co.uk/)(Creating the future of transport)

S-PARAMICS Plug-in

Advanced Version

Advanced traffic simulation can be performed by linking with S-PARAMICS in which the road shape data can be exchanged.The roundabout imported from S-Paramics. The node with roundabout attribution and the transition of right section are expressed in UC-win/Road.

■Sample

The 9th 3D VR Simulation Contest data, Transfer VR simulation at Junjon Service Area in Korea" GTSM Inc. (Korea), converted into S-PARAMICS data.

S-PARAMICS developed b y ：SIAS Company, UK

Aimsun Linkage Plug-in NEW

Option in additional cost

Vehicle behavior and signal phase from Aimsun (traffic modeling software that allows you to model roads and intersections, assign signal phase and traffic, and run mesoscopic and hybrid simulation based on the assigned conditions) can be reproduced real-time within the UC- win/Road 3D environment using the plug-in. In addition, by taking control of the vehicle within the animation played in UC-win/Road, the behavior of the driven vehicle over time can be reflected to the simulation in Aimsun.

Developed by TSS (Spain)

SIDRA Plug-in

Advanced Version

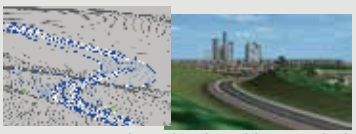
This plug-in enables you to express intersections that are designed in the intersection design software SIDRA as VR. The output file is used for generating a simple representation of one intersection, an accurate road axial sections, a traffic volume, and a timing of the traffic signals.

SIDRA developed by: Akcelik & Associates Company

Plugin for Civil 3D

Advanced Version

This system provides total support, including VR simulations and support for presentations, by linking UC-win/Road with Autodesk Civil 3D, a leap into the future solution which has brought a significant shift within the civil engineering design process.



Civil 3D developed by Autodesk

Loading parking model plug-in (See also p.56)

Option in additional cost

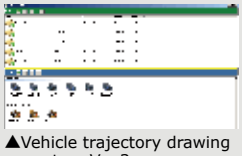
It is a plug-in which imports the parking drawing data made by CAD system "UC-1 parking lot drawing system of FORUM8.

- Outer parking bays, internal parking and signs (driving direction etc) can be accurately represented according to the CAD drawings.
- Since the imported drawing data is treated as a model which is similar to the building and the car, it can be set on an arbitrary position or the drawing itself can be rotated.
- Rendering performance has been improved using the Vertex Buffer Object for visualizing the parking model.

Vehicle trajectory driving VR simulation

By using with "UC-1 vehicle trajectory drawing system Ver.3", the driving trajectory can be expressed in 3D simulation (UC-win/Road Micro Simulation Player is separately required.).

▲Parking lot can be confirmed from any given viewpoints.



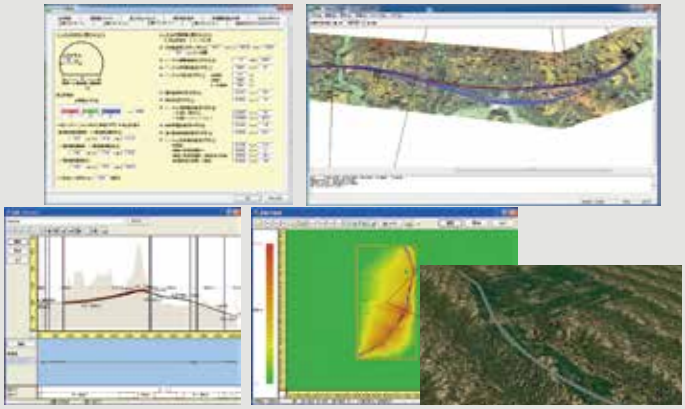
▲Vehicle trajectory drawing system Ver.3

OHPASS plug-in NEW

Option in additional cost

The calculation result of OHPASS (Optimal Highway Path Automatic Search System) can be linked with UC-win/Road. The optimal highway pass obtained by calculation can immediately be visualized in UC-win/Road. OHPASS will be linked with UC-win/Road by following the steps below.

1. Calculates the optimal highway path via OHPASS
2. Convert the calculation results file into LandXML
3. Import LandXML into UC-win/Road



TRACKS Plug-in

Advanced Version

TRACKS is a suite of some sixty programs which have been developed by Gabites Porter Consultants to assist the analysis and interpretation of land use and transport planning problems. The result of TRACKS can be simulated by importing with a LandXML file.

TRACKS developed by Gabites Porter : http://www.gabites.co.nz/

12d Model Plug-in

Option in additional cost

12d allows fast production in a wide variety of projects including mapping, site layouts, road, rail and highway design, residential & land developments, and environmental impact studies.

Data link from UC-win/Road to 12d Model

■Link of topography data: Topography data of UC-win/Road can be converted and exported to Tin file of 12d Ascii File Format.

■Link of road data : Horizontal alignment data and the cross section data is converted and exported to 12d Model.

Data link from 12d Model to UC-win/Road

■Link of terrain data : Tin model of 12d Model terrain can be converted to UC-win /Road terrain data or terrain patch data.

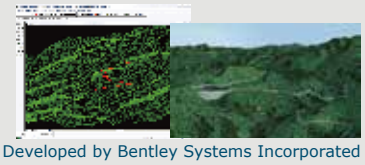
■Link of road data : Import road data created in the 12d Model.

Developed by 12 Solutions Pty Ltd, Australia

InRoads Plug-in

Advanced Version

"InRoads", 3D land development /Road design system, can exchange data based on LandXML data reading/writing function. Horizontal cross section data is exchanged through the use of InRoads original XML format.



Developed by Bentley Systems Incorporated

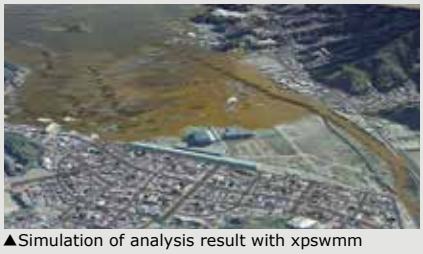
▲Combined driving (Driving on the line + K-turn)

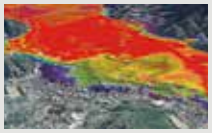
xpswmm Plug-in Ver.2 (for Tsunami)

Advanced Version

This is a dynamic 3D simulation of the tsunami analysis result by xpswmm. Tsunami expression function by UC-win/Road.

◆Special lecture by Professor Fumihiko Imamura of Tohoku University was held.「Analysis of Tsunami and Disaster Control」 (The second international VR symposium 19th November, 2008)





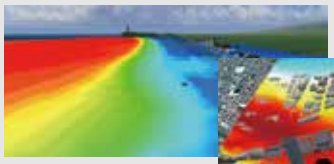
▲Simulation of analysis result with xpswmm

Tsunami plug-in

Option in additional cost

General-purpose plug-in that realizes the reproduction and visualization of tsunami via various type of simulation.This can visualize the situation of generation, movement and immersion of tsunami. This visualize not only tsunami but also river flood and sewer flooding. FORUM8's original open format is implementable. Data of any form can be visualized by converting the format. The function to import the aerial photo and terrain patch from the other plug-in is also implemented.

・Our original open format has been released. Various kinds of results can be visualized by converting to this format.
・Terrain mesh data used for the analysis can now be imported.
・The reflection of the water surface and ripple, contour map showing water depth height, flow



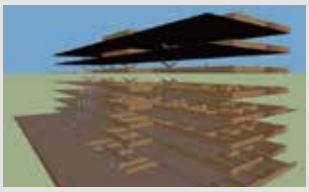
▲Contour of water depth

▲Contour of altitude

UC-win/Road for EXODUS

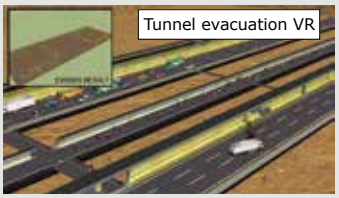
Advanced Version

Data link of UC-win/Road and "EXODUS/ SMARTFIRE" which was developed by Fire Safety Engineering Group (FSEG) in the university of Greenwich (England), fire analysis allows the viewing of the simulation result in 3D VR space.



▲Example of evacuation model display

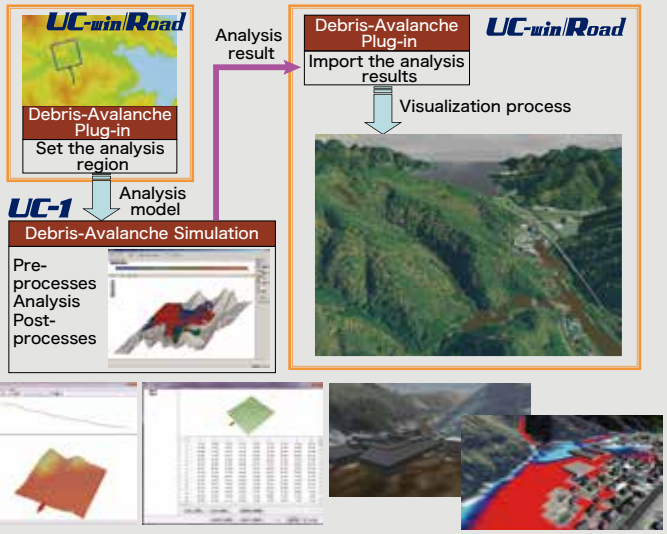
◆Calculation method of evacuation time approved by Tokyo Fire Department



Debris-Avalanche Simulation Plug-in

Option in additional cost

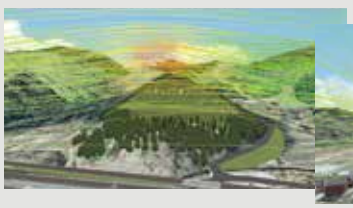
The UC-1 Debris-Avalanche Simulation uses "Debris-Avalanche Simulator (Kanako)" developed in the Graduate School of Agriculture, Kyoto University, as a solver. FORUM8 has built the robust function that pre-processes and post-processes the data to be analyzed so that a debris-avalanche analysis can be run effectively in a series of process while incorporating the solver, and that's how this intelligent solution named UC-1 Debris-Avalanche Simulation came to be.



Plug-in for Super Computing® fluid analysis via cloud

Option in additional cost

High-performance computing on cloud services
Fluid Analysis Super Computing Analysis/ Simulation Service. It is possible to simulate the complicated flow of water including turbulent heat transfer by importing the water analysis tool "OpenFOAM". Visualization of the stream line from VTK (Visualization Tool Kit) file is also supported.



■Wind and Heat Movement Analysis Super Computing Analysis/ Simulation Service

This is the analysis/ simulation support service using the water analysis tool "OpenFOAM" already installed in the FOCUS super computer.

▼Analysis result by OpenFOAM

Noise Simulation Option

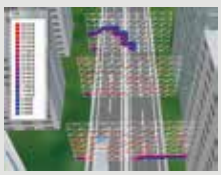
Advanced Version

Width of general sound range is simulated by arranging a sound source and an audience area on 3D and VR space on UC-win/Road. In consideration of the influence of earth surface, a structure, a building, etc. the sound pressure level in each audience point on a audience side is analyzed. Noise simulation consists of preprocessor (input part), mainprocessor (analysis part) and postprocessor (Results view part).

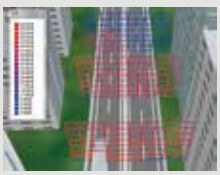
▲Setting of audio source

▲Arrangement of audience area

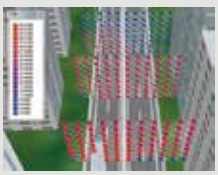
▲Display of Contour figure



▲Display of Contour line



▲Display of grid



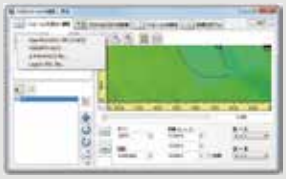
▲Display of sphere

Legion plug-in

Option in additional cost

The Legion Studio software simulates and analyzes pedestrian movements, step by step, within a defined space using the very latest scientific methodology. This enables the precise simulation of pedestrians within a wide range of environments and was developed by Legion Co.UK.

■Principal Use : Congestion mitigation of pedestrians within train stations and airport terminals etc. Evacuation planning. Evaluation, verification and proposal of alternatives for guiding the audience in stadiums and concert venue. Simulation of emergency evacuation within buildings, skyscrapers etc and the examination of possible countermeasures.



▲Importing Legion file

▲Visualization example of crowd simulation in a station

"Pedestrian flow VR simulation for sidewalk construction"
Shanghai Chikushi Engineering Consultants Co., Ltd.▼

Free Viewer Output Plug-in

Ultimate Version

Plug-in to output the data file for UC-win/Road Free Viewer Version

■UC-win/Road Free Viewer Version

This is viewer product for free which allows to freely move in 3D environment and play the scripts. It is possible to browse the RD data created for free viewer version for free. This is the function limited version of Presentation Version. Data and scenarios cannot be created.

RoadDataViewer plug-in

Standard Version

This is the plug-in which displays the list of information of object (building and tree), texture, intersection etc. in a tree format.

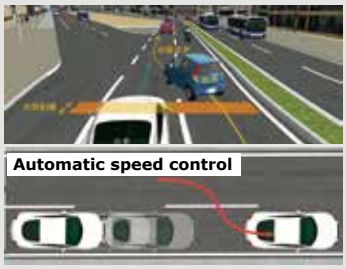
- Verifying the number of pixel of texture
- Verification of unconnected road connection point
- Verification of buried model

Scenario Plug-in

Advanced Version
DrivingSim Version

When the car reaches a set position, pre-set model activity and various scenarios can be made, such as "Signal mast changes to red", "Car pushes in at the intersection", "traffic congestion occurs", "a man starts walking" By using these scenarios, the plug-in offers a real-vehicle-like driving simulation environment with realistic events.It's available to provide the real driving simulator.

- Analysis results of EXODUS and Micro Simulation Player Plug-in are controlled via scenario. Result of evacuation simulation can be replayed, camera mode can be changed, Micro Simulation Player can be played and stopped, to name some of the many things the scenario plug-in is capable of doing.
- It is possible to dynamically change the speed, the number of lane etc. of the other vehicles. The parameter of ACC function can be changed in case of your vehicle and the same parameter of the other vehicle can be changed in case of auto-driving.
- Staggered vehicle and vehicles' pulling over can be expressed by setting the other vehicle's cutting and traffic lane keep offset.



Communication Plug-in

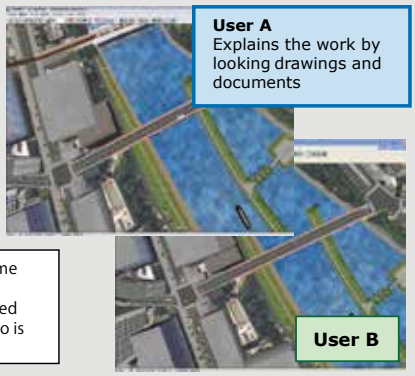
Advanced Version
DrivingSim Version

This Plug-in allows communication with multi users by the use of UC-win/Road. Users can send chatting comment and surrounding information in UC-win/Road such as view position, direction and time through the Internet. These feature enables you to support joint designing and consensus building. In addition, it allows for network-based driving simulation.

1. Joint modeling work

▲Explanatory material

- You can show your partner the same view that you are looking at.
- It becomes easier with the displayed model to explain to the person who is not familiar with the data.



Micro Simulation Player Plug-in

Advanced Version
DrivingSim Version

Micro Simulation Player is the function to run various types of simulation animation which is depicted as 3D model movement. It is capable to record and play a traffic flow as a result of UC-win/Road and other traffic simulation.

Main features

1. 3D animation function: It's possible to create various type of 3D model's animation based on the information of model's location. It enables to run several data at the same time.
2. Snap function for vehicle and pedestrians: It's capable to locate objects such as vehicle and pedestrian on the road and the lane, the pedestrian, the ground.
3. Controlling the existing objects: It's possible to control static objects such as traffic light.
4. Controlling drawing objects: Time, weather, light
5. Optimal integration with the functions of UC-win/Road: Traffic, script, camera mode

■Analysis of traffic accident

This function allows the users to perform interference checks on the imported traffic flow by using the simulation result; this in turn enables you to apply the results of traffic flow analysis for the course on which you drive within a driving simulator and thus confirming the traffic condition from the point of view of the driver.

▲Control the surrounding vehicles by using the micro simulation player

OpenMicroSim website
http://openmicrosim.org/

■Traffic simulation Record/Play
Result of traffic simulation by UC-win/Road

■Evacuation simulation
Virtualizes the analysis result by EXODUS

■Analysis of traffic accident
Virtualizes based on the accident record

■4D Simulation
3D Model Simulation for construction step

Surrounding traffic vehicles optimize the reproduction function of simulation. The function to detect the distance between the running vehicle in front of you and yourself at the time of driving is also supported. This detection function enables you to obtain the information including the speed and position etc. of the leading vehicle.

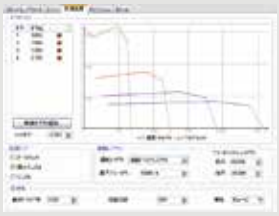
Driving Simulation Plug-in

DrivingSim Version

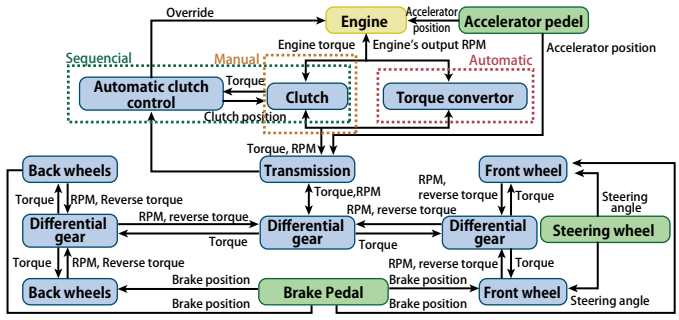
With UC-win/Road and real car driving simulator with OEM-supplied, the driving simulation is much more realistic. Compared with a conventional driving simulator, a great improvement of the cost-performance is seen. Moreover, the biggest feature is that the user can freely use existing data or create a scenario specific to their needs.Equipped with models of every transmission inside the a real vehicle linking the engine with wheels, a highly realistic vehicle dynamics can be visualized and the behavior of vehicle itself can be confirmed. You can choose your favorite vehicle dynamics model.

- ·Vehicle acceleration based on engine power, RPM, and weight is taken into account
- ·Supports Force feedback effect: The steering wheel vibrates automatically depending on the road surface texture and road geometry.
- ·Supports Antilock Brake System and gear shift time
- ·Tire slip: Road surface condition (dry, wet, show, ice) can be assigned.
- ·Sound effect system: Engine sound, break wind sound, slipping sound, engine sound of surrounding vehicles, etc.

▲Assign engine



▲Assign transmission



▲Structure of UC-win/Road's Vehicle Dynamics model

Motion Platform Plug-in

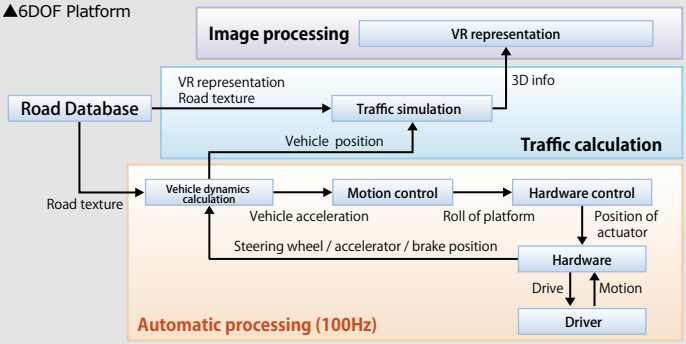
Option in additional cost (provided only for system development)

An optional driving simulation feature that links the software to the OEM motion platform hardware of INNOSIMULATION, Inc

▲It is possible to perform 6 degrees of freedom movement of surge, sway, heave, roll, pitch and yaw

▲6DOF Drive Simulator

▲6DOF Platform



Driver Training Plug-in NEW

Option in additional cost

System that assesses driver's driving skill.

The driver is assessed for correct operating procedure and driving skill, against criteria that include maintaining certain speed and an ideal route, manueovring skills, collision risk control, and steering and pedal control. You can assign scoring criteria and also store assessment results for each driver, which assists in pinpointing areas for improvement.

cycleStreet Linkage Plug-in NEW

Option in additional cost

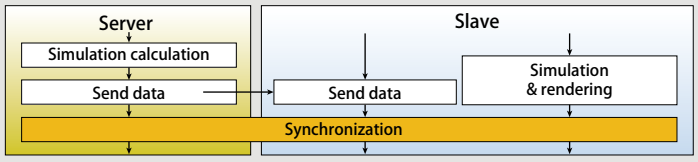
Virtual cycling system "Cycle Street Series City Edition" (Developer: FLOVEL CO., LTD.) is linked with UC-win/Road that renders a panorama image of 3D VR environment on 3 screens. As you cycle, the CG moves according to the speed of the rotating pedals, allowing you to get some exercise as if you're playing a game.

Cluster Plug-in Ver.UP

Option in additional cost

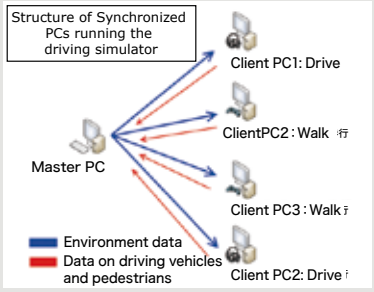
UC-win/Road Cluster allows more than 4 channel display per PC and can synchronize two or more PC and output the image to a lot of monitors. It can be used for a simulator using a 360-degree domed screen and 6K digital signage. It becomes possible to secure the constant performance without an influence from the number of channels. Synchronizes multiple PCs within a network to enable multiple drivers to race on a same track.

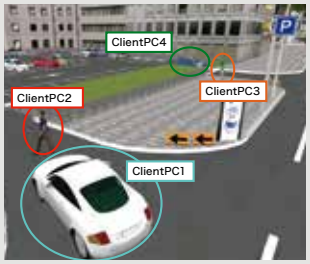
1. Easy set up and operation
2. Flexible system with no limitations to the number and configuration of clustered PCs
3. A variety of simulations are possible in this multipurpose system which has all elements synchronized



▲6 Screen Digital Signage System

▲Dome-type Driving Simulator





▲Synchronizes multiple PCs within a network

Replay Option

DrivingSim Version

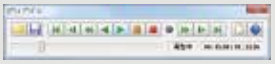
The function which records vehicles, a pedestrian, etc. which move every moment over 1 second in real time on tens of times , and is reproduced.
Combination with scenario:A start and play of record at the time of event are possible.
Data management method:ZCompression of record data by Zlib (Compression algorithm used for ZIP)
Combination with UC-win/Road SDK:Record from SDK side and control of play are possible.

Replay memorizing function is available for below	
Vehicle coordinate	roll, pitch, yaw, turn signal, brake lights etc.
Pedestrian	movements, roll, pitch, yaw
Traffic light	lighting situation
Context	context in scenario live

Because the vehicle records every little behavior (roll, pitch, yaw) as seen on right pictures, vehicle behavior when it goes over a shoulder or when it hits something is reproduced with high fidelity.


▲Confirmation of accident during drive simulation from outside of vehicle


▲Tool bar


▲Operation panel

Eco-Drive Plug-in

DrivingSim Version

The Eco-Drive plug-in is a new software module that calculates the fuel consumption and carbon footprint of individual vehicles whilst driving through a 3D VR model and graphs the results by means of UC-win/Road's driving log.CIternatively they can "Calculate the carbon footprint". The various parameters within the Eco-Drive evaluation formula are all capable of being altered by the user. All Eco-Drive data is automatically read within the Drive Log data file so that calculations can be re-created.

Log Output plug-in

Option in additional cost

Coordinate information, direction, speed and steering angle of a driving vehicle can be output to a log. Traffic flow and characters can now be exported. It is now possible to save in CSV format or output UDP in real time through a network. A function that allows you to export the distance from your own vehicle to a specified model to a log file is also implemented. You can define the types of data and the order in which you wish to export them to a log file at your own will.

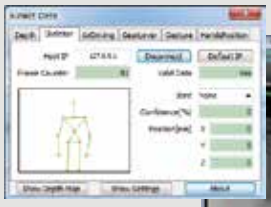
Log output data	
Basic data	Simulation time, model name, model ID, model type
Coordinate, attitude	X coordinate, Y coordinate, Z coordinate, pitch angle, yaw angle,roll angle, vector
Engine, speed	The number of engine rotation, gear number, car speed (km/h,m/s), speed restraint
Input	Steel wheel angle, accelerator position, braking amount,automatic driving
Distance	Running distance, distance from the starting point, distance fromthe edge of the road

Kinect plug-in

Option in additional cost

By linking the range imagery sensor (KinectTM・Xtion Pro / Live) with UC-win/Road (The range imagery sensor / joint position / gesture / hands' opening-closing etc.), the vehicles and robots in UC-win/Road can be operated without any control devices.


▲Depth Map data

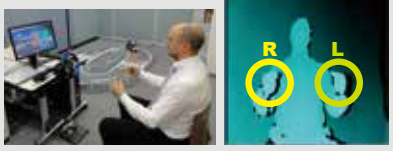

▲Skelton tracking data


▲Air Driving data

Kinect™ Driving Simulator

Handless driving simulation with infrared sensor

This system allows the operation of UC-win/Road by moving the arms as operating the steering in front of Kinect.



UC-win/Road Air Driving technology

It allows a highly-detailed driving operation without any control devices.

Recognition of skeleton:The system is able to recognize the user from the distance information detected by an infrared depth sensor and can distinguish human features. Moreover, it's calibrated and the skeleton structure is recognized. Detection of steering angle and steering direction : The right and left direction of the steering wheel and its steering angle are detected as an analog value from the positional relationship between the user's right and left fist. How much the steering wheel is turned is indicated by a row of bars that change color from green to red.

Multi-cluster digital signage system with infrared depth sensor

The multi cluster digital signage system via infrared depth sensor.
The interactive digital signage system uses a 6K display on multi screens as well as the infrared depth sensor.

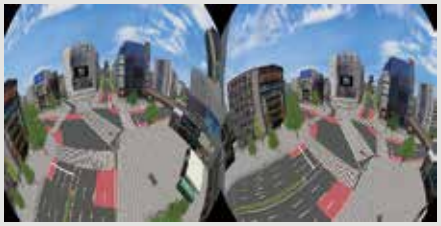
This system can be interactively operated using the function of gesture interface and motion capture. Xtion PRO of the infrared depth sensor is used for inputting.

Oculus Rift plug-in

Option in additional cost

Developed by Oculus (http://www.oculusvr.com/)

Oculus Rift:Head mounted display which enables head tracking via built-in sensor and allows you to output 3D video with a wide field of view at an affordable price.
The sensor data of Oculus Rift is obtained and the viewpoint within UC-win/Road is tracked according to the head of users. In addition, it is possible to set the distortion correction of the images.


▲Fish-eye rendering


▲Stereo

UC-win/Road for Robocar®

Option in additional cost

This VR simulation system will link UC-win/Road with car robotics platform "Robocar®" in which the robot technology is mounted and controls the 1/10 scaled model car on a model road by driving in VR space. Various traffic circumstances and scenarios can be set and implemented through being able to use the virtual reality space expressed by VR.

Associated Products

VR-Cloud® Ver.5.2

Registered trademark No.2011-8512

VR-Cloud® is a consensus building solution which uses 3D and VR on a cloud server. As long as you are connected to the Internet, you can take control of VR space even on a thin client.

●VR-Cloud® Standard

Various kinds of simulation can now be experienced very smoothly by implementing a unique transmission technology "a3S".

- Operation mode (viewpoint, movement)
  Freemode (Free view point position by interactive)
  Various kinds of simulation (road running, Flypass flying and free walking)
  Executing a script (Automatic presentation), scenario and replaying video
  Selection of vehicle model for driving simulation
  Manual driving using keyboard (patent obtained)
- Setting for context (collective setting), traffic flow and preferences ON/OFF
- Displaying homemenu (data summary, favorite, browsing history)
- Multi client and operation by the acquisition of operation authority have been supported.
- Client of Android version can acquire the location information using GPS
- xpswmm simulation (results of flood and tsunami analysis etc.)
- VR-Cloud® SDK and VR-Cloud® script plug-ins are implemented

▲Home menu

▲Main menu

▲Simulation menu

▲Driving simulation

▲Walking simulation, display of avatar

▲Selection of vehicle models in driving simulation

•Rhino Plug-in (Option in additional cost) NEW

Plug-in that displays 3D models built by Rhinoceros® (Robert McNeel & Associates http://www.en.la.mcneel.com/) within the 3D environment of UC-win/Road.

- Data are transferred back-and-forth between UC-win/Road (server) and Rhinoceros® (client) via a3s; 3D model in the process of being built by Rhinoceros® is reflected in UC-win/Road. Model positioned within the 3D environment can be edited.
- With the combination of VR-Cloud®, Rhinoceros® can be browsed by VR-Cloud® user.

▲Correction of the display position

▲Setting of the drawing style ▲Setting of the drawing quality

●VR-Cloud® Collaboration

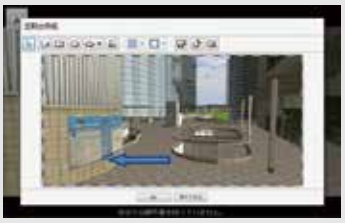
Full VR cloud system which enables the high quality communication between clients.

■3D bulletin board function
- Creating landscape VR environment
- Display icon and response from the other users

■Landscape Evaluation function
- Creating landscape evaluation in VR space with marking and HTML output of a list

■Annotation function
- Comments in the disucussion is displayed in VR space.
- Displayed icon and response from the other users

▲Landscape Evaluation function



▲Annotation function

■Photo function
- Displaying icon in 3DVR environment, browsing, editing and deleting photos are possible.
- Selection of camera position from GPS of Android™ terminal

■Conference function
- Share of viewpoint-communication with text, video and sound
- Access restriction using a password

▲Photo function

▲Contents viewer

▲Android client version / Discussion function

●VR-Cloud® Flash Version(Former UC-win/Road for SaaS)

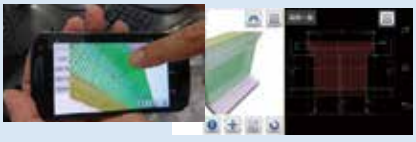
Unlike UC-win/Road for SaaS, remote control of VR space using Adobe Flash Player on the web is possible, hence no need to install software to the client

Use of advanced transmission control technology "a3s"

3D bar arrangement CAD for SaaS

- Photo data link function to shoot photos via Android™ terminal and then store them in relation to the viewpoint of bar arrangement data is implemented.
- It is now possible to access data within UC-1 for SaaS cloud file sharing server of FORUM8.

A field tool going ahead of times of CIM supporting the simultaneous display for bar arrangement drawing in 2D / 3D via Android™ terminal.



●VR-Cloud®Product Price ※UC-win/Road is optional

Product	Price
VR-Cloud® Collaboration	US$5,500
VR-Cloud® Standard	US$3,360
VR-Cloud® Flash Version	US$3,360
Rhino Plug-in	US$1,000

●Server configurration example (UC-win/Road 1 data)

Product	UC-win/Road Ultimate	UC-win/Road Advanced	UC-win/Road Standard
VR-Cloud® Collaboration	US$20,000	US$14,000	US$10,800
VR-Cloud® Standard	US$18,000	US$12,000	US$8,800
VR-Cloud® Flash Version	US$18,000	US$12,000	US$8,800

Experience on VR-Cloud®!

Experience on VR-Cloud®! Special Page:
http://www.forum8.co.jp/english/uc-win/VC-taiken-e.htm

•The 13th 3DVR Simulation Contest Awards/12th Grand Prix

"Cooperative ITS Driving Simulator"
TOYOTA MOTOR CORPORATION.

"Simulation for environmental upgrading around Higashi Takase river"
Fushimi Technical High School in Kyoto

"QuikDeck Promotion VR Data"
Nisso Industries Co., Ltd.

"DSSS Experience VR Data"
UTMS Society of Japan

"Residential Building Design VR Simulation for N House" atelier DoN

"Construction VR Simulation for the bridge replacement" SOZOTECH

"Onuma Floating Istands landscape simulation" Sanyu Eng. Ltd

"Driving support agent VR simulation"
Doshisha University

"G'EduCom in Bordeaux"
ITS Bordeaux La CUB & BMIA

"Redlands California Flood Analysis Project using VR" Michael Baker International

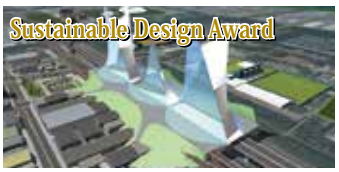
"Tokyo Metro Simulator"
Tokyo Metro Co., Ltd.

12th "VR Simulation for Traffic Regulation to Divert Traffic During Night Construction"
Iwasaki CO., LTD

•Virtual Design World Cup～Student BIM & VR Design Contest on Cloud

4th "The S.T.A.R.S. (Sustainable Taches and Reactivate Space) " Kanazawa University
KUUPL

4th "AwardTokyo_Sustainable Development"
University of Transport and Communication
INED_UT



4th "Connected Yumenoshima, Optimised Circulation for the Olympics" Robert Gordon University International Architectural Think Tank Inc.

4th "gather"
Tokyo University + Yamaguchi University
T.O.F.U

4th "Walkerizing City" Shibaura Institute of Technology / Graduated school of Shibaura Institute of Technology shellfish

4th "√SHINKIBA"
Ritsumeikan University
DDP

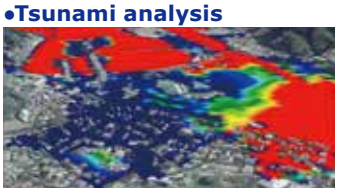
3rd " Breathing Station "
Nihon University
HULAN

3rd "Drafty Port"
Shibaura Institute of Technology
Red.

2nd "Noah's Ark -Tokyo 2050-"
Shibaura Institute of Technology SWD LAB

1st "The Oasis"
Kanazawa University Urban city Lab

•Tsunami analysis


xpswmm tsunami analysis data

•UC-win/Road DS Standard VR data


Metropolitan Expressway No. 4 Shinjuku line

•Blog Architecture and urban：3D Degital City


Kyoto：Arashiyama


Japan：Nanshin


Germany：Freiburg

•Event Information


Booth of the 20th 3D & Virtual Reality Expo

•FORUM8 offices


Tokyo head office（Shinagawa Intercity）


Osaka Branch office


Miyazaki Branch office


Fukuoka Business Office

Associated Products

UC-win/Road SDK Ver.8(Development Kit)

API for customizing UC-win/Road. Sample program is attached and DelphiXE2 is now supported.

The Software Development Kit (SDK) includes Library and API for developing a plug-in that can run on UC-win/Road as well as the sample program. The development language is DelphiXE2 (Earlier version than Ver.7 uses Delphi2010). Using API enables to freely develop the option at the same level as UC-win/Road basic plug-in.

Products configuration:

Library folder : Various library files required to compile the plug-in are stored.
Plugins folder : Source code of various sample programs is stored. Compiling and executing it would help you understand the features that are controllable in SDK.
UIL folder : Framework required for creating UC-win/Road plug-in is stored.
Help file : Available only in English.

API functions: Editing, reading and writing data

Terrain	GRID / Patch (TIN)
Aerial Photo	White and read the aerial photo
Road	horizontal alignment, longitudinal alignment, Obtaining shape of 3D model, cross section, bridge space, tunnel space, section interpolation, texture
Intersection	stop points; texture; assignment of traffic signals; percentage of cars turning left, right, and going straight; traffic control (traffic light etc.)
Traffic	Traffic volume, Setting of vehicles' disappearance and generation, Setting of traffic profile and vehicle group
Model	Placing models

Development of various input and output plug-in

: Data linkage with the software developed by your own is feasible.

【Development Case】

・Exodus plug-in

・xpswmm plug-in

・Display road map plug-in

Sample Program

Program to assign various conditions of the traffic flow. "Traffic Generator Set" is added to tool menu. Clicking this allows to add "Optional traffic volume point" on the center of each road to allow you to assign basic traffic conditions. Traffic generation points on the edge of each road can also be assigned.

※Please contact FORUM8 if you require customization development

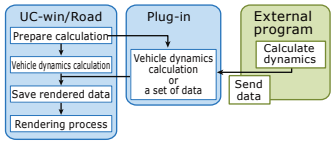
■Related books

"The Introductory guide of the advanced graphic language -OpenGL Ver.4&CUDA-"
"Programming for civil engineer" – SDK programming with Delphi -

■Browse and change static data that comprise the whole VR environment.

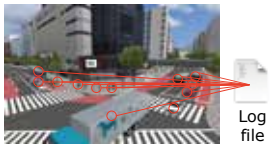
■Control model/character in real-time

■Control Driving Simulation



■Control camera position in the main window

■Logging function Log file



■Creative drawing via OpenGL control

■Features on GUI

VR-Cloud® SDK

A customized development kit of script operating on VR-Cloud® client

The following list indicates what can be achieved by using the scripting language (AngelScript) and a commercial text editor, importing the program into the system via the VR-Cloud® script plug-in. The script language is very similar in structure to C/C++.

- **Customizing the user interface of VR-Cloud® client such as adding new menu and buttons.**
- **Developing many different GUIs each one specific for different content to be published on-line**
- **Assigning various different kinds of commands such as those used to change the camera (viewpoint) position and the environment, as well as commands used to initiate driving**

a3s(Anything as a Service) SDK NEW

A customizing kit of data transmission library "a3S" used for general application development

The a3S (Anything as a Service) Multimedia Cloud System allows you to create your own cloud applications. It is possible to provide various types of cloud service by taking advantage of the video/audio streaming technology and the large-capacity data transmission/reception technology that uses the high-speed data transmission system.

a3S SDK Development Kit License:US$3,000 a3S Client (10 clients):US$4,400
a3S Server License:US$4,000 Unlimited clients:US$5,500

◆a3S Cloud Transmission Library : Patent granted for FORUM8's unique data transmission system, data transmission device, and data transmission method(September 20, 2013)

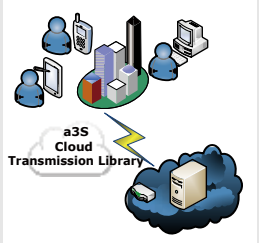
The Development of a cloud system using our cutting-edge architecture

a3S is FORUM8's in-house developed multimedia cloud technology that allows high quality video and audio to be supported and streamed between the server and client application, as well as the high-speed transmission of large-capacity data. This SDK allows you to use the various functions that a3S has to offer to develop a cloud computing application.

・Supported Platforms:Windows
(Android, Linux, iOS will be supported in the next version.)
・Development Language:C/C++, Delphi™

Supports both public cloud and private cloud

・Cloud based data sharing systems and large-capacity data transmission services
・Video hosting and video on-demand services
・Chat features, bulletin boards, and message services
・Cloud based gaming services
・Developing a cloud version of the existing application

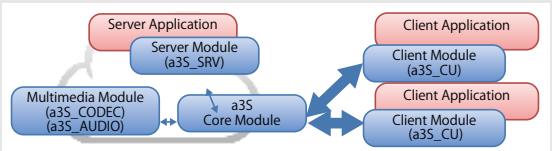


Core modules of a3S multimedia cloud system

a3S Protocol : Connects the core parts controlling TCP protocols, the server and each and every client. It also controls commands, and manages the synchronization and authorization system.
a3S Multimedia : Encodes and decodes the videos via the latest video compression techniques, and enables audio streaming without occupying too much CPU.
a3S Data : Data management system which allows transmission of up to 4GB of data at one time

Example of creating a system using a3S

VR-Cloud® was developed using a3S technology. This software has the ability to enable high-quality real-time images and sound, such as that of moving vehicles, to be sent from a server running the Interactive 3D VR Simulation software UC-win/Road, to client machines so that they can share and interact with the 3D VR environment. An individual client's key strokes, mouse events, and GPS coordinates, as well as images captured by a camera are sent to the server and they are reflected in UC-win/Road's 3D environment running on the server.



UC-win/Road free Viewer

This free viewer product allows you to move around the 3D environment as well as play and replay scripts. Data file exported from UC-win/Road Free Viewer Export Plug-in (US$750) can be imported and browsed.

- RD data designed especially for the Free Viewer version can be browsed for free.
- This is a basically a Presentation version with limited features. Data and scenarios cannot be created.
- The software can be downloaded from the User Information Page (go to Download Service link after logging in). You can login to this page from the top page of the official FORUM8 website by entering in your Usercode and Password.

UC-win/Road Presentation Version

Product delivery styles

Useful presentation version is available!

With UC-win/Road, there is a presentation version (52,500 yen). VR features available are similar to UC-win/Road. A variety of visual option functions allows you to do various simulations. With delivery in AVI file, a screen view is recorded through the AVI option feature (84,000 yen) and, if necessary, it can be mixed with voice or music using Premier (Adobe) and such. When directly printing out other captured images, it is recommended that you do so in a higher resolution.(Example of maximum resolution: 4096x1536 pixels when dual screens are used)

UC-win/Road Educational Version

Education software for creating VR

Target: Primary students, Junior high school student, High school students (under 18) Price : US$540

UC-win/Road Web Viewer is a web software allowing the display of 3D VR data created by UC-win/Road on Internet Explorer (IE). Viewing and simulation of 3D VR on the PC without UC-win/Road product version is made possible.

Popular with youngsters!
UC-win/Road
Driving Simulator

Product Configuration

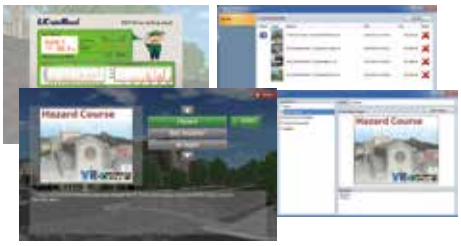
- UC-win/Road Advanced base.Web match-up mode
- Data compatibility with UC-win/Road is not supported
- UC-win/Road DB is available during effective period of maintenance contract
- Web registration of UC-win/Road data (Stop motions x 2, descriptions)
- Data registered by users can be available

Additional Options	・UC-win/Road Driving Simulator Plug-in	US$330
	・UC-win/Road Eco-Drive Plug-in	US$330
	・UC-win/Road Data Exchange Tool	US$240
Separately Sold Hardware	・Steering Wheel	

VR-Drive

A Driving Simulation Package that lets you feel the real driving sensation as you hold onto the wheel which is fairly easy to control.

VR-Drive provides an economical way to educate young people in the art of road safety by offering students the opportunity to drive in a 3D Virtual Environment and experience real life everyday driving scenarios.
ECO drive plug-in is installed on it and carbon footprint data in the form of CO2 emissions and fuel consumption are calculated after each drive and the printed report shows how the driver has performed.



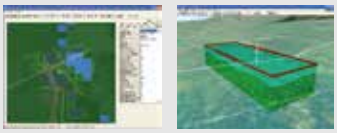
Hardware : VR-Drive software, Logitec steering system for game, PC with graphic card are required.
Customization : VR-Drive consists of 3D environment and the driving scenario designed with traffic specialist.The customization of 3D environment can be flexibly performed, and the specific driving can be generated as you specify.(Estimation is required separately)
Interactive driving scenario : The driving scenario under bad conditions (pedestrian, bicycle driver, left-turn, right-turn, road with poor visibility) are predefined in VR-Drive.The young driver can experience the realistic road with the driving scenario.
Driving skill report : The report is generated after the experience of each driving scenario so that the experienced driver will be able to give appropriate advise based on this report.
Eco drive report : The report of CO2 emission amount and the fuel consumption is created for each driving.The young driver can learn the preciousness of human life and the contribution for the environment.
Visual effect : The driving in different condition such as rain/snow and daytime/night time can be experienced.The setting of surrounding environment including wind, flood, fire, smoke is available.

UC-win/Road Data Exchange Tool

The tool collection for DXF Data exchange, SIMA Data exchange, 3D model exchange, Horizontal alignment IP calculation, Tunnel cross section calculation in UC-win/Road

Road Data Viewer

Verification feature
Feature for creating Report / Road alignment basic input table
Create terrain patch data



SIMA Data exchange tool

Supports SIMA common format Ver.3 (C04: Curve element attribute data). You can also export data to road cross section data file (*.rs).

Tunnel cross section calculation tool

A program that calculates tunnel's cross sectional shape based on the standard established by the Japan Highway Public Corporation, and converts to UC-win/Road's road cross section file.

Civil engineering 3D model creation tool (Parametric)

3D model creation assistance tool in which parameters of the civil infrastructure's dimensions can be input as means of modeling. Abutment, bridge pier, retaining wall, BOX can be created in a style unique to our UC-1 series products.

Civil engineering 3D model creation tool (Frame)

3D model creation assistance tool via generator. Models can be created using frames and section, same way models are created in UC-win/FRAME(3D).

Embankment edge 3D model creation tool

3D model creation tool that creates embankment edge using a cone that constitute one fourth of a regular embankment. The model of the embankment edge can be easily created by defining each dimensions whilst referencing shape.

GeoMap3D Data exchange tool

3DS models can be converted to a format common to 3DS models of stratum data exported from Geomap3D. Ground surface can be converted to UC-win/Road terrain patch data.

Horizontal alignment IP calculation tool

A program that calculates an IP point required when defining roads in UC-win/Road from a turning point on the horizontal alignment from horizontal calculation report.

3D model exchange tool

You can convert UC-win/Road's 3D model terrain patch file to a 3DS file format.

DXF Data exchange tool

Converts DXF data including terrain data to UC-win/Road terrain data XML fomat.

VR Simulation data creation tool based on traffic census (under development)

Traffic information from road traffic census (by CD version and Japan Society Traffic Engineerings) can be assigned to UC-win/Road's traffic olume/profile.Traffic volume at different days and time of day can be assigned to each road can be assigned together with your choice of vehicles to be put on traffic. The development of a weighting feature is also planned.

VR-Studio®

Japanese/English/French/Chinese/korean avialable
Registered trademark No.5132945

Large scale data : This does not have a limit on the scale of data, you can create large scale data of over 100km. You can add terrain area. VR-Studio® has 50m mesh DEM data. (use of survey data is approved by Geographical Survey Institute)
Multi reality : This function allows comparing of multiple plans. All of the models, or part of the models can be switched to another condition-reality. It allows examining multiple marking plans of intersections, comparing road alignments and comparing house developments and other plans.
Multiuser editing : VR-Studio allows the editing of one project by multi users. Users can share the data with the source management server, and manage store and synchronize. By using management server, complete editing history can be recorded and edited.
Traffic simulation function : Because you can export or import between the projects, you can reduce cost and time of data production.

Tokyo→ Mt. Fuji → Performing fly through to the center of Nagoya in stress-free

UC-win/Road DB

Internet Data Base

Online Database Containing VR models Number of models (as of 2014. 06. 09) : 3D models : 3678, textures : 3874, sections : 83, sample data : 85 Download function to download from the database of 3D Models, textures, section data etc. using the Internet. It is available for all users to download directly from the products. *Free of charge for products with a valid maintenance support.

●DB for VR Model

3D 2D Trees

3D tree
leaves / trunk / flowers

2D tree
tall evergreen trees / evergreen trees / evergreen shrubs
tall deciduous trees / deciduous trees / deciduous shrubs
tall flowering trees / flowering trees / flowering shrubs
house plants

MD3 character human model

Characters: animals / humans

Vehicles / Equipment / Running models

Road vehicles
passenger cars / trucks, trailers, cabs
buses and taxis / bicycles, motorcycles / special vehicles

3D cockpit

Railway vehicles
Bullet trains / utility trains / monorails

Airports / harbors / river facilities
port facilities / harbor signal equipments
rivers, flood control facilities

Aviation / marine vessels, construction heavy duty equipments, temporary equipments

Buildings / Facilities / Structure models

Buildings / Houses / Stores / Steel towers
office buildings (super high-rise) / (mid to low-rise) /
building (low-rise) / condominium apartment /
standard homes / stores, markets / industrial facilities /
public facilities / transmission line towers

Railroad / Road structures
bridge superstructures / bridge substructures /
road structures / gate piers, pedestrian bridges /
traffic sign poles / markings

Railroad / road facilities
bridge superstructures /
signs, alarm equipments /
stations, street lights / others

Park facilities
playground equipments / buildings / others
others: advertising displays,
road regulatory equipments /
road accident etc

Roads / Traffic / Traffic sign textures

Paved roads / Railroad surfaces
pavement surfaces / railroad surfaces / others

Banking / Cutting
Grass / concrete blocks / concrete blasting /
others

Guardrails / Curbs / Footpaths / Others

Bridges: truss / beam bridges

Tunnels / Intersections

Traffic signs
indication signs / regulatory signs / guide signs / warning signs
auxiliary signs / railroad signs
local road signs (Korean / Chinese / American / New Zealand /
French / Malaysian / British / Thai / Dutch / Irish /
Vietnamese / German / Indian / Singaporean / Spanish /
Colombian / Brazilian / Finnish / Australian/Turkey/
Lebanon/ Poland/ Portugal/ Sweden/ Switzerland/ Iceland/
Italy/ Austria/ Republic of the Philippines (Philippines)/ Taiwan

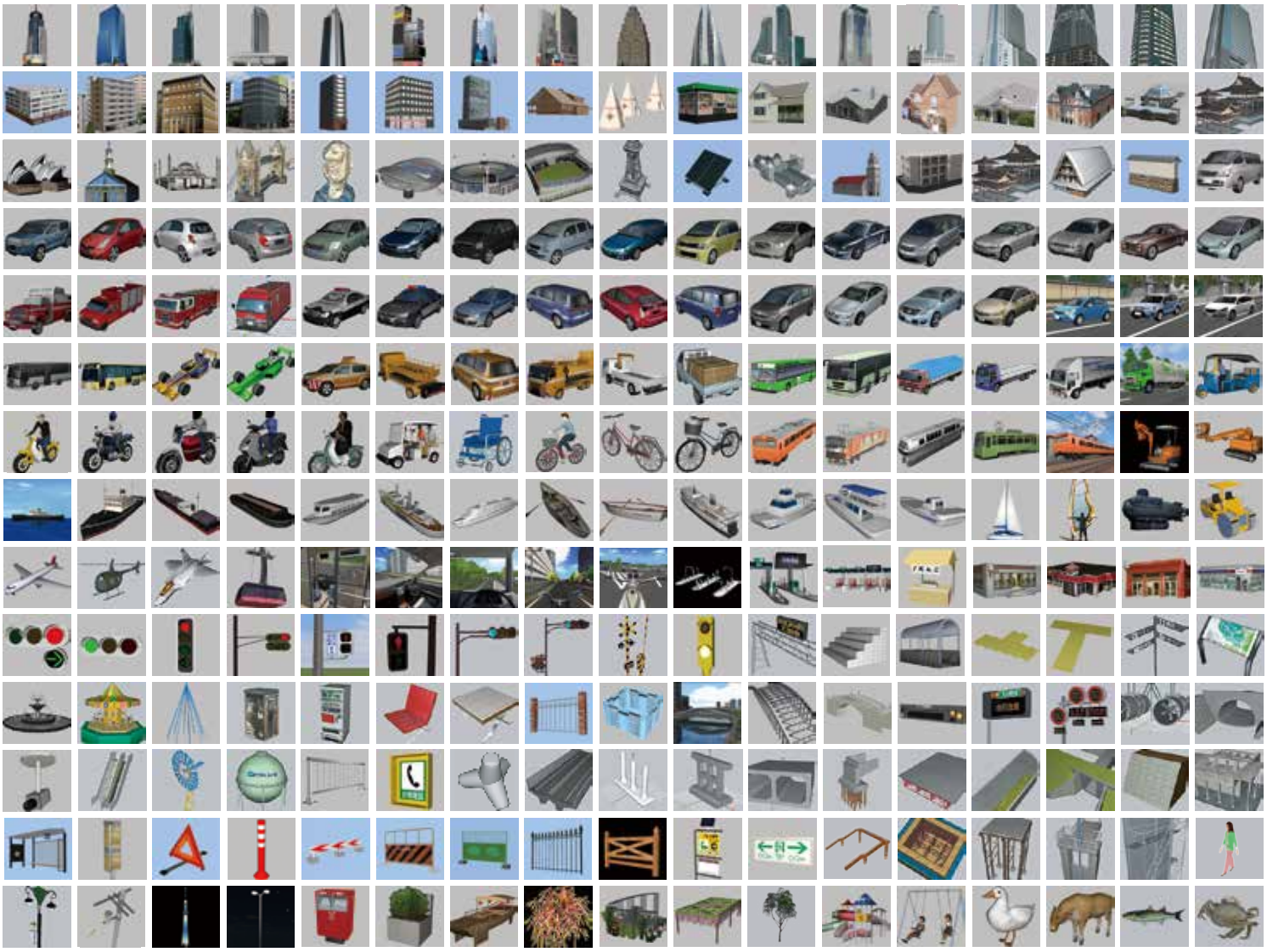
Road markings
indication markings / regulatory markings / others
Korean road markings / Chinese road markings

Background
super high-rise building backdrops / mid to low building groups
low-rise building backdrops / forests, fences

Buildings, rivers, cockpit, sky, sky dome, flags, terrain, water surface, fire and smokes, others

3D Model

It makes data creation more efficient by using various standard models. With this, setting up the model editing tool and movements of models is easy. It enables the loading of the structure models designed in UC-1 series or UC-win and import the 3D models with the textures created by other 3D tools as well.



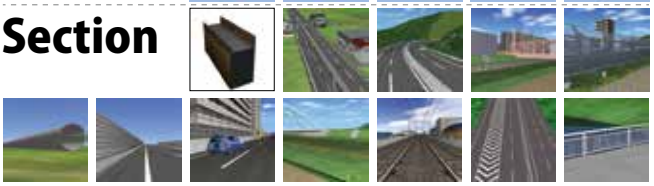
3D Tree

These 3D tree models are only for UC-win/Road. There are many functions attached such as swaying leaves by wind and growing simulation etc.

MD3 Character

FBX

Section

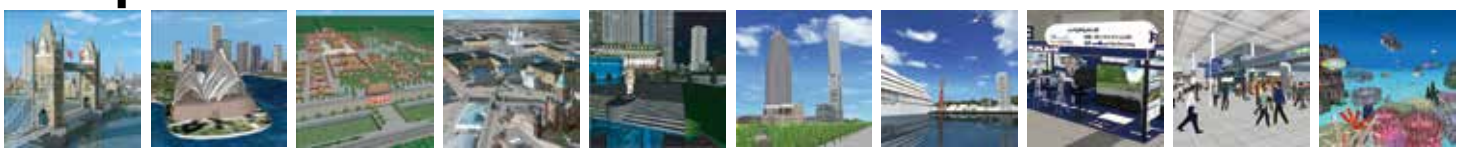


Texture

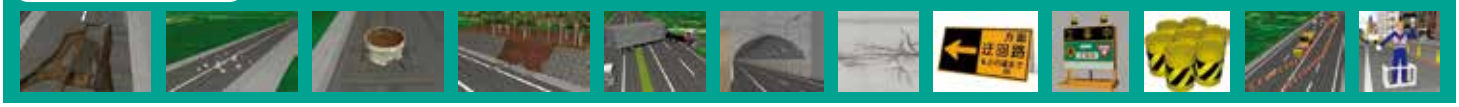
Excellent default textures, default textures of slopes, cuttings, road surfaces, pavements, walls etc. are available. Sky and terrains can be mapped as default, and many special textures such as trees and signs can be arranged according to their specified commands. The textures for cockpit inside vehicles are.also available for use while driving.

Example

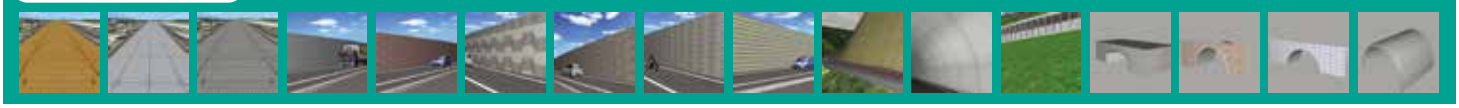
UC-win/Road VR data download (supports world heritages and etc.)



Disasters / Regulation　It supports the models / textures of road hazards. (materials provided by Road Management Technology Center)



Construction Method　It supports textures for each construction method. (materials provided by Hirose Corporation)



Aerial photographs (sold separately)

Digital Ortho images covering entire Japan

■1 mesh starting at US$100 (single license)
Units provided : 1) 2.0km×1.5km / 1 mesh (3km² :unit of national basic map)
2) 4 mesh starting is available for sale.(in case of basic)
(Provided by NTT GEOSPACE CORPORATION)
■ US$30 / km² : 1 user
US$40 / km² : multi user

Units provided :
1) units based on cities, wards, towns, and villages
2) rectangles and other shapes of 4 km×4km or larger (approximately 25 cm / pixel)

(Provided by Asia Air Survey Co., Ltd., Nakanihon Air Service Co., LTD.)

3D Building Model (sold separately)

High-precision 3D building data

・Building shape models via laser measurements
・"Terrain" + "Solid" model data with a 6 km² or 9 km² lot
・Areas provided: Main areas in Kanto, Chubu, Kansai and the government -decreed cities (approximately 10,000 Km²)
■3D building data / terrain data original data price: each US$1,000 / Km²

■Converting data for UC-win/Road 3D building data US$1,500yen / Km²(deleting polygons, dividing layers (for textures))

History

UC-win/Road Development History

History of Upgrade

UC-win/Road improvements over time.

: Software : Option

2000.05
1.00.00 Release

2000.07
1.01.02 Switching from Japanese to English / lane changing.

2000.12
1.01.12 Editing function for elevation points.

2001.06
1.02.00 Custom terrain handling, XML terrain loading Shadow, rain, snow, wind, Level crossings, on / off ramps, Flight paths, driving on the right side of the road, Street map extension

2002.06
1.03.00 World geographic coordinate system, Movable parts for 3D models, Rivers, terrain transparency, Road Markings, power lines, flags, Before / After, Joystick Control

2002.09
SOFTWARE PRODUCTS OF THE YEAR WINNER! 2002 SOFTIC

2003.06
1.05.00 Data merging, Lakes, Cutting, Movement of models by dragging, Measurement between models, 3D Tree Editing, Creating AVI Files

2003.09
1.06.00 2D view window, Support for multiple monitors

2004.06
2.00.00 Traffic generation, Travel route, Lighting effect textures, Script functions, MD3 characters,

2004.09
2.01.00 Forest generation, Wheel base setting, Pivot setting

2005.05
3.00.00 Traffic lights plug-in, Road obstacle plug-in, Indicator and brake lights

2005.12
3.01.00 Drive simulation andcockpit, L-shaped intersection /roundabouts, POV-Ray LandXML

2006.05
3.01.02 UC-win/Road for Civil 3D

2006.09
3.02.00 Support for French and Chinese (Formosan),Vehicle grouping, vehicle appearance and disappearance, Vehicle queues, NZ terrain data loading Multi view displaTracks plug-in

2006.11
3.02.11 (SP1) Level of detail LOD of 3D Trees,Savable view points, Rear-view mirror, side mirror and car navigation in 3D cockpit, 3D display size setting, Expanded script commands

2007.07
3.03.00 Space Navigator 3D mouse, Advanced game controller settings Improvement of draft mode, performance function, shadow expression, Internationalization (UNICODE, traffic rules etc.) Support for creation of transparent road crosssections, real-time shading

2008.08
3.04.00 Edit traffic texture and building Full screen Simulation panel Driving interaction Creating scenario Driving simulation plug-in Shape file

2009.02
3.04.04 Scenario function expanded GIS plug-in Vehicle wheel rotated Displaying rudder angle function UC-win/Road data and DB supported.

2009.02~2009.10
3.04.05~3.04.13 UC-win/Road Micro Simulation Player plug-in, UC-win/R Motion Platform option, Fire and smoke expressions, UC-win/Road Eco-Drive plug-in, OSCADY plug-in, xpswmm plug-in

2009.11
4.00.00 Lighting function, improvement of rain expressions, 3D stereo display, Cuttings rounding function, Context, Support landscapes of the world, Traffic connector, Integration of plug-ins

2014.07
10.00.00 Import/export DWG Functions of train and crowd movement enhanced Head tracking Stratification Based Hierarchical Clustering Aimsun plug-in Oculus Rift plug-in Driver training plug-in

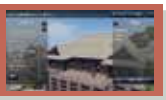
2014.04
9.01.00 ACC/Automatic driving Universal UI plug-in added Function to control the other vehicles via scenario function Kinect plug-in Scenario control of traffic snap shot Photo-log Point Cloud Modeling Plug-in

2013.06~2014.04
5.00.00~5.02.00 Improvement of user interface and home me VR-Cloud® script plug-in

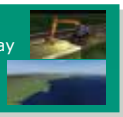
2013.05
9.00.00 Expanded traffic simulation function Parametric model Driving trailer FBX models Cluster system for multi users' operation Expanded Micro Simulation Player

8.01.03 UC-win/Road free viewer output plug-in

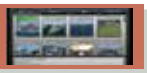
2012.12~2013.04
4.01.00~4.02.00 Photo function and 3D bulletin board Conference function Performance improvement by auto reset of traffic amount and environment



2012.10
8.00.00 Terrain creation, Improvement of headlight and sound Motion control inside an intersection Line shape for railway Tsunami plug-in Log output Expanded cluster function Micro simulation player scenario

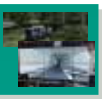


2012.09
4.00.00 Audio supported Inline help JP/CH/KO supported simulation (analysis results for flood and tsunami)



2012.04~2012.05
3.00.00~3.01.00 Audio supported Inline help JP/CH/KO supported simulation (analysis results for flood and tsunami)

7.00.00~7.01.00 Road friction coefficientuby linking with CarSim is supported. Supports horizontal curve of railroad Off road function Sky dome function Cluster option 3D model output plug-in Sidra Presentation function of xpswmm plug-in



2012.03
6.01.00 World file Fluid analysis plug-in VTK visualization tool kit Munsell color space output plug-in Legion plug-in

2012.12~2013.02
2.00.00~2.02.00 Android™ client Improvement of latency Japanese, English and French Log output for access and error Mouse wheel operation Video encode function

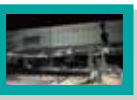
2011.12
6.00.02 Terrain 5m mesh Movement of walking crowd Animation of FBX mod Improvement of Tsunami simulation Animation of FBX model RoadDataViewer IFC 12d Model Replay EXODUS Plugin for loading parking model

2011.06
VR-Cloud **1.00.00 Release**

2011.05
5.20.00 Improvement of vehicle movement model,Italy version to be available, Tunnel lightning function, Revision of scenario function, Keyboard driving, Animation of steering handle, Supports VISSIM, Noise analysis function, Replay option, Cluster option

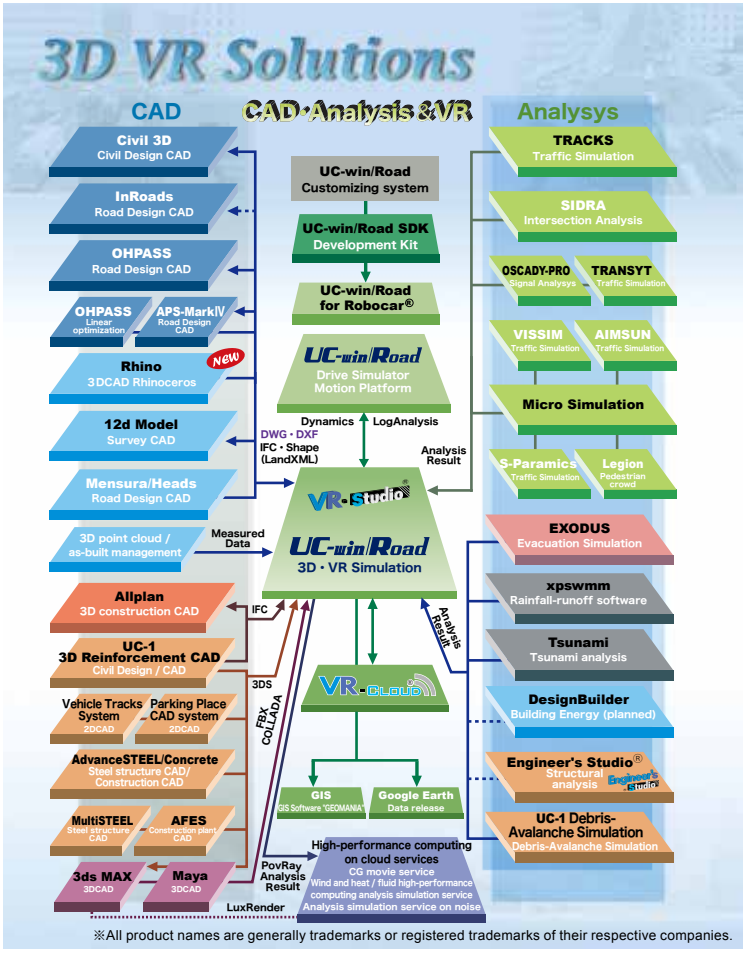
2011.01
5.00.03 It supports Korean, Chinese(Simplified characters), Chinese(Traditional), It supports import to VISSIM of micro simulation player(VISSIM 5.30ANI file, produced by PTV in Germany)

2010.08
5.00.00 UC-win/Road for SaaS Plugin, Point cloud data modeling Plugin FBX LOD Creating rivers, Improvement in road section edit,2D/3D texts, Vehicle dynamics model, Navigation function, Special weather function



3D VR Solution

Data link with various application software



※All product names are generally trademarks or registered trademarks of their respective companies.

Data combination with IFC

It will be possible to visualize a design and analytical data such as geographical data, a building, a civil engineering structure designed by CAD for BIM, by VR.


UC-win/Road→IFC


The example of BuildLiveTokyo 2010 utilizing IFC

Data Link with Road CAD

Total integration system which provides you with Design CAD application and UC-win/Road- civil engineering, such as road/land development, VR simulation and presentation

UC-win/Road for Civil 3D

UC-win/Road can link with next generation solution "Autodesk Civil3D" which brings a paradigm shift to civil engineering design process.

UC-win/Road data exchange tool for Civil3D

UC-win/Road Data Exchange Tool for APS-Win

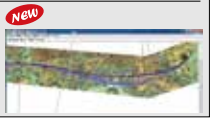
It has the necessary function to examine the road alignment (road curve), railway alignment (sine curve, cubic parabola) and can check designs and calculate coordinates. Moreover results can be outputted as an alignment diagram.

UC-win/Road for 12d Model

12d allows fast production in a wide variety of projects including mapping, site layout, road, rail and highway design, residential & land developments, and environmental impact studies. Importing data of UC-win/Road to 12d Model allows to calculate soil volume and create the detail drawing.

UC-win/Road OHPASS Plugin Option NEW

The optimal highway pass obtained by calculation can immediately be visualized in UC-win/Road thanks to its seamless linkage with OHPASS (Optimal Highway Path Automatic Search System).

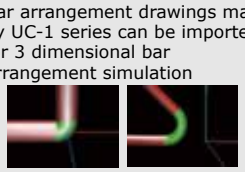


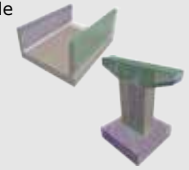
Data link with UC-1 Design Series

3 dimensional bar arrangement simulation

3 dimensional bar arrangement simulation

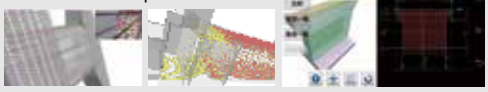
Bar arrangement drawings made by UC-1 series can be imported for 3 dimensional bar arrangement simulation





3D Reinforcement CAD for SaaS

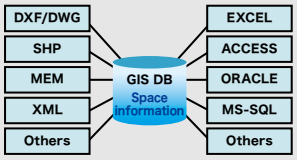
Leading on-site tool in today's CIM era, with an ability to display 3D and 2D reinforcement drawings simultaneously on an Android™ phone.



Data link with GIS applications

UC-win/Road for GIS

Satellite photo
terrain road(line)
flight route
(line spline)
lake (Polygon)



Data link with road applications

By linking with "OSCADY PRO", traffic light design and "TRACKS", land usage and traffic modeling system, realizes VR simulation

OSCADY PRO

In cooperation with UC-win/Road, confirmation of analysis result of OSCADY PRO in VR space of 3D is possible.

TRL (http://www.trl.co.uk/)

TRANSYT

Specified format is provided from UC-win/Road. Vehicle position information is linked up with TRANSYT.

Aimsun

Public transportation, pedestrians/ vehicles are reproduced by dynamic traffic assignment technique.

Spain TSS-Transport Simulation Systems (http://www.aimsun.com/)

VISSIM

The micro simulation system VISSIM and UC-win/Road are cooperated in mutual directions.

PTV (http://www.ptvag.com/)

S-PARAMICS

It is possible to visualize the result analyzed by S-PARAMICS.

SIAS (http://www.paramics.co.uk)

TRACKS

Link with TRACKS by LAND XML file through NEX (road network editing program)

SIDRA SOLUTIONS (http://www.sidrasolutions.com/)

SIDRA

Plug-in for VR expressing the intersection designed by SIDRA by UC-win/Road.

Gabites Porter (http://www.gabites.co.nz)

Data link with simulation software

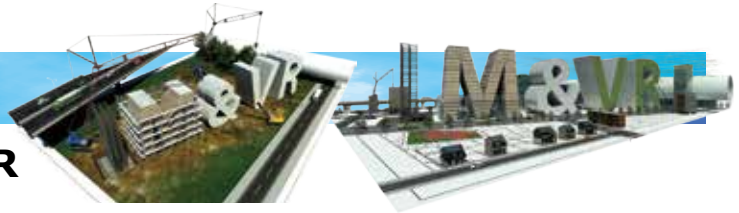
By linking with "EXODUS", evacuation analysis and flood analysis "xpswmm" realizes VR simulation

UC-win/Road for EXODUS

Data link of UC-win/Road and "EXODUS", evacuation analysis and "Smartfire", fire analysis allows the viewing of the simulation result in 3D VR space

UC-win/Road for xpswmm

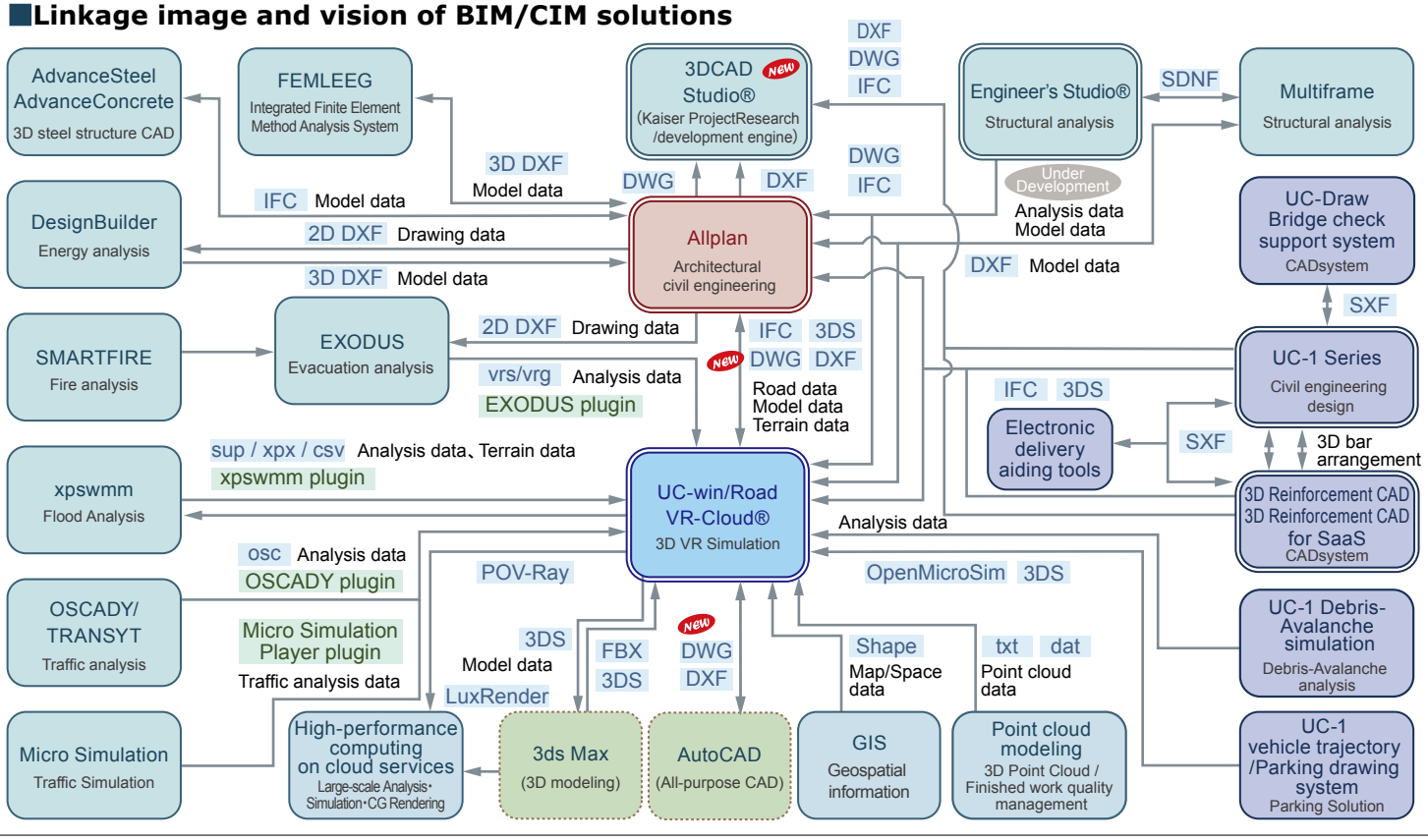
Allows viewing in 3D the result of "xpswmm", flood analysis and run-off water analysis. Information to get Visualization of the terrain model (importing shape file) / Time history change of the rise and fall of flood water surface / Time history change of the water flow vector of running water / Time history change of the flow in conduit and conduit flow velocity.



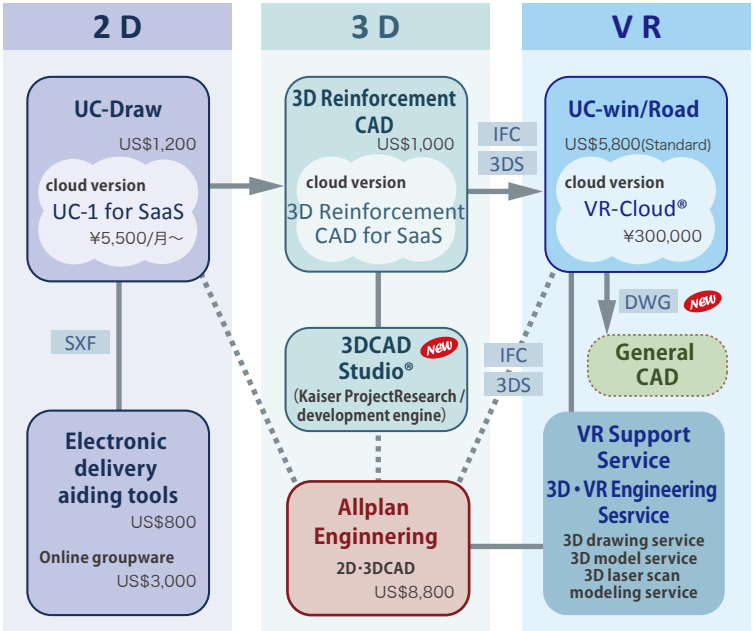
Integrated solution via BIM / CIM&VR

BIM / CIM refer to a model into which various information concerning architecture and civil engineering is integrated, and a technique to create/manage/maintain/utilize this model. By considering the model as a single model that describes the entire construction process from design and construction to maintenance and management in creating 2D/3D drawing, and by unifying an entire BIM information including 2D and 3D drawings, material specifications, quantity, a rough estimate on construction fee, and management information, information of all kinds required for the life cycle support of architectural buildings and infrastructures can be designed and visualized continuously.Regarding VR and UC-win/Road, "IM & VR Simulation" will be proposed by linking with various kinds of simulation (landscape, daylight, traffic, wind, noise, flood and tsunami, evacuation, energy analysis, construction plan etc.) for front loading (consensus formation, plan).

■Linkage image and vision of BIM/CIM solutions



■CIM Solution 2D・3D Drawing /VR ／ Price



Build Live Tokyo 2010

Won the IFC Data Linkage Award

FORUM8 joined Build Live Tokyo 2010 on 13 – 15 October, as TeamF8W16. Virtually designed the Media Art Center via BIM linkage / 3D Modeling

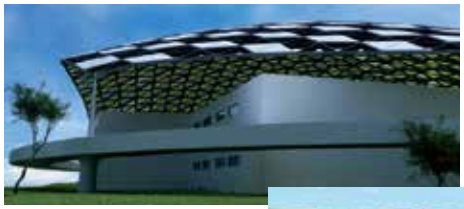


Image of VR presentation

Import point cloud of surrounding region measured via 3D scanner

Output via 3D printer

●Create VR in 3D drawing Export the VR scenes via DWG tool / import cross section

✦ Export DWG (Left : Result of exporting DWG, Right : UC-win/Road)

✦ Export DWG (Left : Result of exporting DWG, Right : UC-win/Road)

✦ Conversion of DWG cross section file

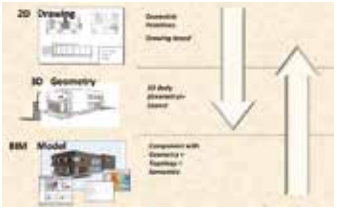
3D drawing service

3D drawing option/ total service of report and drawing

Any drawings in 3D! - Allplan viwer and 3D Reinforcement CAD are supported.

Outline

By using BIM integration solution of Allplan series, 3D drawing and 2D drawing are created.It offers the data having the standard setting such as condition of reinforcing bar differed by the colors with Allplan viewer. You can utilize it for various study, use for 2D drawing, development to the software having BIM function (IFC data conversion).However in case of 2D drawing in Allplan, since it currently does not support SXF exchange, SXF convertible software such as our product UC-Draw is used.The end result is based on the data submissioin and can offer it as Allplan 3D data (supports IFC) output. It is intended for construction and civil engineering structure.



▲Image for integrated BIM solution

Allplan

Allplan is a BIM integrated solution developed by Nemetschek, CAD maker in Germany.It can continuously design and express any information which is required for lifestyle of buildings such as basic drawing, rendering image and presentation image, detailed working drawing, quantity calculation, quantity survey and so on.

▲Design of buildings by Allplan Architecture

▲Design of civil engineering structure by Allplan Engineering

3D bar arrangement CAD

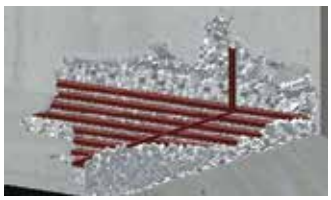
It is possible to check the interference of bar arrangement and cover thickness via 3Dbar arrangement CAD

3D sample model of damaged and repaired status intended for current structure objects

We are introducing how to perform 3D expression of the status for damaged and repaired points as for the existing structures based on the application example of 3D drawing service.

The real reproduction by 3D model is possible.

The damaged points of structures and 3D model image after repair are introduced. As of exposed points of rebar, it is possible to express by modelization and arrangement of rebar one by one.separately.Reinforcement of arrangement and duplication can be reproduced based on the existing drawings.It is possible not only to express the color of building frame, rebar, and aggregate by being close to the actual color, but to show exaggerated colors on 3D model.Moreover, in case the structure exists underwater, by creating the model and changing the transmission rate, the expression of transparent water is possible.By this application, it is possible to express the underwater model as well.



▲Exposed rebar image

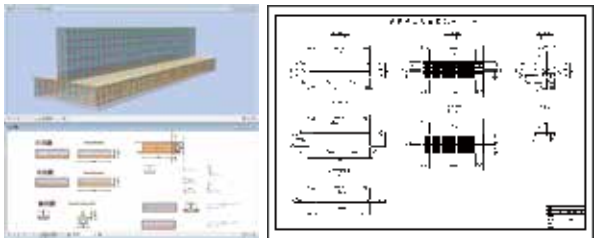
▲Underwater Janker image

▲Damage

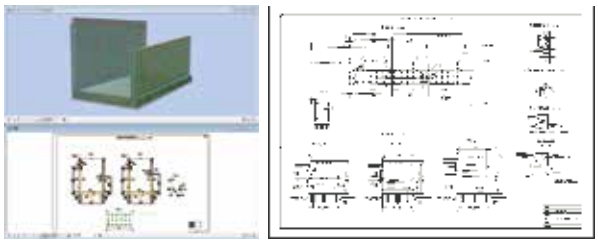
▲After repair

Example of 3D and 2D bar arrangement drawing

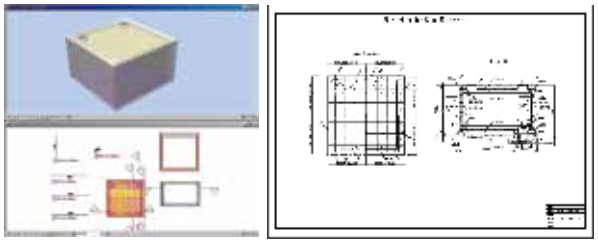
Example of 3D bar arrangement drawing and 2D drawing edited via CAD software, UC-Draw etc., by sampling temporary bridge (substructure), U-shaped revetment and water tank.



▲sampling temporary bridge (substructure)



▲U-shaped revetment



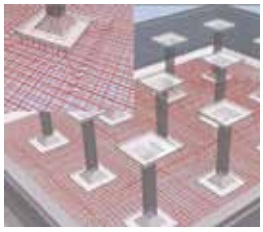
▲Water tank

Distributing reservoir sample model

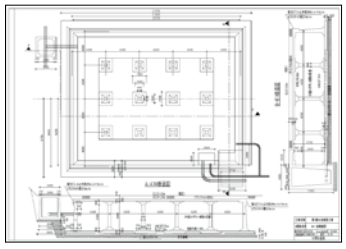
We are introducing the sample cases performing the modeling of distributing reservoir used Allplan Engineering which has the strong rebar arrangement tool for RC structure.

Advantage for BIM model of 3D

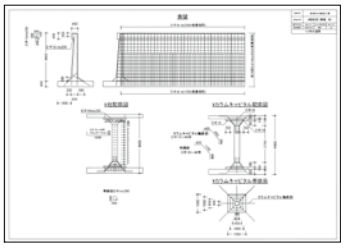
Modeling of this sample was performed after analyzing the handwritten old drawing.Once the drawing was converted from 2D to 3D, everyone would be able to understand a complicated bar arrangement situation intuitively by displaying walk through animation and VR like this sample.Practical use of BIM in the management and the future repair phase such as reinforcment of concrete and rebar degraded in aging, and reinforcement based on visualized rebar arrangement by creating 3 D model having attribute.,For example, it is also possible to express a damage condition based on an investigation report.Moreover, structural analysis is conducted by the model created through another modeling processes as well.



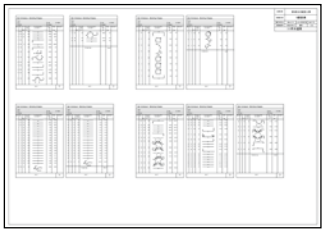
▲Distributing reservoir model



▲General structure figure



▲Bar arrangement drawing (Side wall, pole)



▲Reinforcing bar chart

▲Report：The amount of concrete

3D printing service (3D model service)

Service to print VR models in 3D

Print VR models in 3D! - UC-win/Road supporting 3DS output

Outline

It's the service which outputs various 3D models, the real "model" by 3D printer, output by UC-1 series, Allplan, and
of course UC-win/Road, UC-win/FRAME(3D) and so on.
Top- of- the- line Zprinter650 of Z corporation is used, and it outputs 3d model of full- color by ink-jet.
Design range is Horizontal 254mm×Height 381mm×Depth 203mm in industry's largest class. Dividing and outputting the model at the appropriate position make it possible to create even if the model is larger than this design range. The design time is several minutes for small model and a few hours to ten hours for big models.

▲Zprinter main unit (Tokyo head showroom)

Process of model output via 3D printer

3D printer "Zprinter650" allows to import files including STL, VRML, PLY, 3DS, ZPR format. However it is believed that using 3D modeling tool including 3dsMax etc. enables to broaden the range of file formats available and most of 3D modeling format will be able to be output.

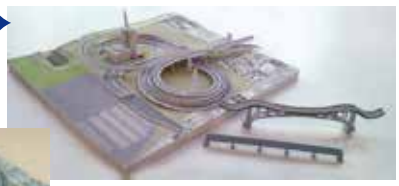
1.Output via Zprinter650

2.After outputting, dust off excess flour.

3.Vacuum gypsum powder

4.Dust off excess flour again

5. Impregnating material



6.Complete

3D Modeling sample quotation

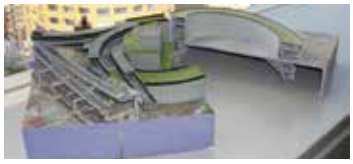
Quotation example of 3D model service, web quotation service 3D model service supports web quotation service. The quoted price of the service can be calculated in easy operation on web browser. >>**https://www2.forum8.co.jp/3dmodel/**

1 : Taishi junction model	
The total working man-hour day (Subtotal A)	2.6(h)
Man- hour (Subtotal B)	US$295
Direct labor costs (Subtotal C=A*B)	US$767
General overhead expense (Subtotal D)	US$613
Material cost, indirect cost (Subtotal E)	US$320
Total （C+D+E）	**US$1,700**

Longitudinal 25(cm)×Horizontal 23(cm)×Height 2(cm)

※Taishi junction model is a contest winner of Kanagawa Construction Bureau, Metropolitan expressway.

2 : Ohashi junction model （The model divided in North）	
The total working man-hour day (Subtotal A)	4.1(h)
Man- hour (Subtotal B)	US$295
Direct labor costs (Subtotal C=A*B)	US$1209
General overhead expense (Subtotal D)	US$967
Material cost, indirect cost (Subtotal E)	US$2,324
Total （C+D+E）	**US$4,500**



Longitudinal 25(cm)×Horizontal 30(cm)×Height 13(cm)

※Ohashi junction model is a contest winner of Metropolitan expressway.

Sample image

▲UC-win/Road DS 3D Model printing

▲Actual size of 3 dimentional Laboratory for vibration destruction (E- defence)

▲Wind analysis model in Shibuya

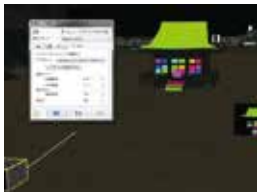
▲Buzenda Hosoe area Shopping street

Practical use to projection mapping

By running a projection simulation via UC-win/Road and 3D Engineering Service, image can be confirmed by either looking at the VR model or by exporting the model to a physical miniature model prior to the actual event.
The solution is an ideal tool for verification of contents, discussion with stakeholders, explanation and advertising to the customer, and of course advertisements before and after the projection event.

▲3D model of a building is created based on the point cloud data of the target building measured by a 3D laser scanner.

▲Use of 3D Engineering Service（3D model creation ）



▲Use of UC-win/Road

3D Laser Scan Modeling Service

Point cloud measuring by 3D laser scan and VR modeling service

Real-time VR supporting 70 million point – UC-win/Road Point Cloud VR Modeling

Outline

In UC-win/Road Ver.5,UC-win/Road point cloud data which enables users to import and edit point cloud data in real time can read the point cloud data collected by 3D laser scanner for various usage.In the past, it was only reference usage for display or 3D application, however by using this service, the display and edit of over 70million points data in real time will be possible. Forum 8 offers point cloud measure by 3D laser scanner, modeling and VR modeling by supply point clud data(UC-win/Road support service). It is possible to support measuring data prepared by users and measuring data from supplier as well.

▲3D laser scanner

▲Point cloud data imported into UC-win/Road (Nihonbashi, downtown Tokyo)

Measurement in 2DS

Completed in short time period

Light weight (12.2kg)

Approximately 200m can be surveyed using pulser method

5000 lasers can be fired per seconds

Beam thickness can be adjusted to up to 50 meters

Connect to a PC via LAN to set the scan range inside the captures images

Measurement target → **Capture image** → **Set the scan range** → **Scan** → **Color assignment based on the photograph**

▲Scanning procedure

Point-cloud Plug-in

- Display of 3D point-cloud data to VR space
- A variety of editing function including creation of horizontal and vertical center line
- Supported point-cloud number 32bit : less than 40,000,000 64bit : more than 70,000,000
- Conversion land and ocean bed into Tin, pasting of the image
- Automatic color assignment for aerial photographs
- Exporting to LandXML

Photo-log point cloud modeling plug-in : Function to color 3D point cloud data

Example of 3D scan modeling service quotation

Generally, measurement at minimum two points is required for 100m roads.It takes about 1 hour for the preparation, measurement and movement to the next point in every measurement point.In case public survey reference point is located outside of measuring range, the same measurement shall be conducted.Measurement accuracy will be about 4 million points in the 100m section by 1.5cm interval's point cloud in 20m ahead.In addition, the submission of application for the permission to the local police station several days before the date of measurment is required measurement on a road.Moreover, although an application of the permission may be required for the use of the reference point of a public survey, we would be able to prepare and submit the application instead of your company.

3D Scan Modeling	
Including one mesurement point of public reference points for acquisitino of coordinate. Cost for measuring by two persons in one party and one traffic arrangement staff is required separately. Including the preparation for measurement and post-processing of measurement data.	
Measuring section	300m length.
Measurement of reference point	2place
Measuring days	1 day
Measuring preparation, post-processing of meaurement data	2 people for each, total about 1 days
Total cost	**US$1,623**

3D･VR Modeling	
The section of the measured point group data is expressed by VR. Adjustment of the advanced space as per the point cloud group (Quotation of UC-win/Road Excellent B level). Create and arrange a road, 20 buildings along a road, 5 types of signs, 2 kinds of 3D trees and power pole.	
Geography, line shape, 3D model, texture handling	300m(UC-win/Road Standard Estimate)
Modeling of building, sign, plants and so on	20 buildings, 5 kinds of signs, to create 2 kinds of 3D tree
Total cost	**US$4,111**

Sample image

▲Simulation for a landscaping plan using point cloud data (11th 3D･VR simulation contes Excellnt Award Kyushu-orient Servey&Design Co., Ltd.

▲Hanshin Expressway (9th 3D･VR simulation contest Grand Prix Kansai University Faculty of Informatics)

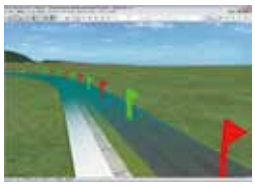
▲Scenery review by measuring data (BuildLiveTokyo2010)

▲Shibuya intersection

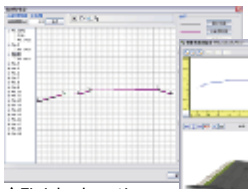
VR modeling service for finished work management scanned in 3D

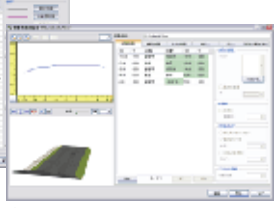
Finished work management service by comparing 3D scanning and 3DVR modeling

This is used to compare 3D scanning and 3DVR modeling and create reports of various finished work. Firstly the basic design data and measured data (FORUM8's point cloud measurement system is also used, if required.) is provided from customers and create reports of finished work based on them, which are delivered.



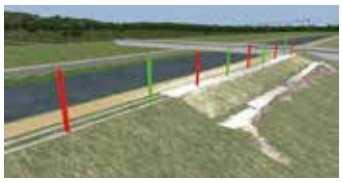
▲Retaining wall



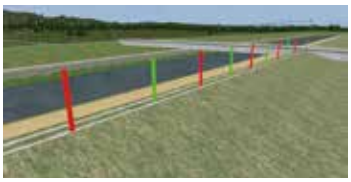


▲Finished section

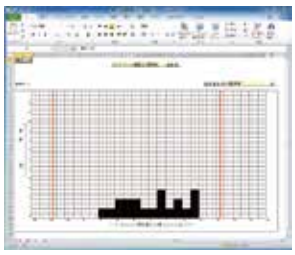
Basic design data + Measured data at construction site → 3DVR modeling data, creating finished work management reports → Delivery



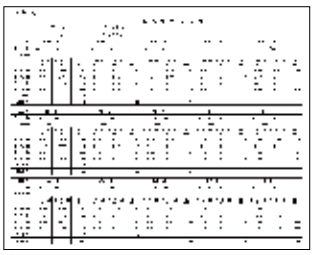
▲Embankment (point cloud displayed)



▲Embankment (no point cloud)



▲Excel file (Style 85)



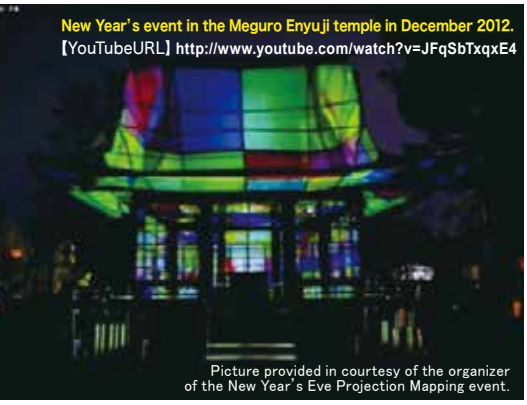
▲Summary for measurement result

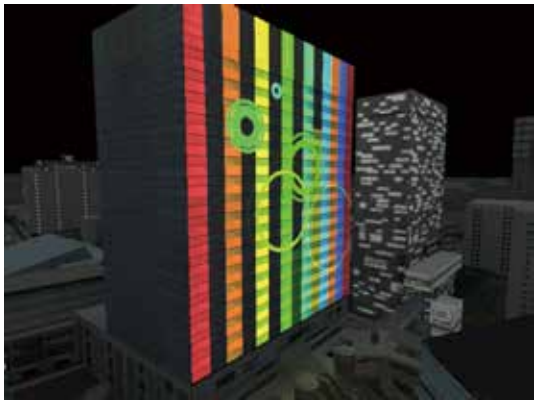
3D Projection Mapping

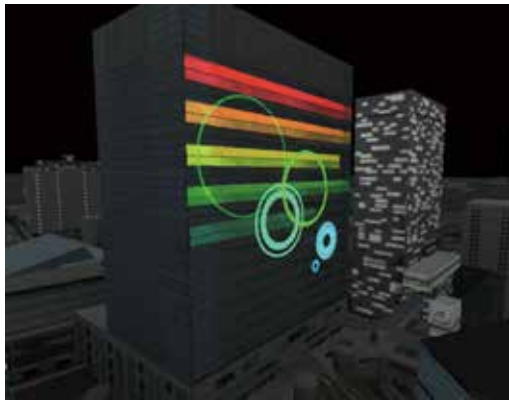
The practice of projecting an image on a physical structure using 3D VR technology and contents **Proposal System**

FORUM8 offers the state-of-the-art spatial visualization technology that uses 3D VR data and image, namely the "3D Projection Mapping".

Coorporate： The Association of State of the Art Technologies in Visual Expression





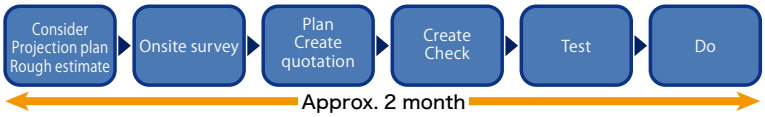


▲VR data projected on building wall as an image

Overview of 3D Projection Mapping Service

Projection Mapping is a cutting-edge image representation technique in which VR image is projected on a physical structure (3D structure) such as buildings, cars, and furniture using a projector. Projection Mapping is widely used in Europe as lighting in concerts, events, advertisements, and urban scenes, and to attract more tourists to resorts. The technology has many applications from drawing more people to events and stores, to revitalization of local towns.

■Work flow of Projection Mapping



※ Schedule may vary depending on the specification

Projection solution that uses VR

By running a projection simulation via UC-win/Road and 3D Engineering Service, image can be confirmed by either looking at the VR model or by exporting the model to a physical miniature model prior to the actual event. The solution is an ideal tool for verification of contents, discussion with stakeholders, explanation and advertising to the customer, and of course advertisements before and after the projection event.

■The use of UC-win/Road and 3D Engineering Service on Projection Mapping

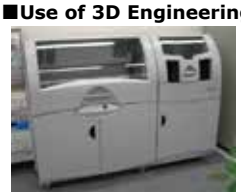
① Measure point cloud data and model

3D model of a building is created based on the point cloud data of the target building measured by a 3D laser scanner.

Create 3D model of a building based on measured the point cloud data.

② Projection simulation

■Use of 3D Engineering Service



■Use of UC-win/Road

Crowd simulation results from both EXODUS and Legion are combined to verify walking path of every individual.

An actual train station and pedestrians are reproduced within the VR environment whose image is projected by a virtual projector. Projection simulation can be run from any camera position, on any time of day, and under any weather conditions.

An example of model projection plan

An example of a plan

- Location : A relatively dark place outdoor and relatively easy to install and do projection mapping without affect traffic.
- Target structure : A tower shaped building with simple geometry
- Building size : W10m × D6m × H20m
- Building's material : Bricks (brown/opaque)
- Number of location from which image shall be projected : 2 at most.
- Projection distance : approx. 15m (A: near) approx. 40m (B: far)

■Image of 10,000/20,000 rumen Projection plan via projector

10,000 lumen has less brightness and area compared to 20,000 lumen. 20,000 lumen is usually recommended.

■List of model projection plans (2D, 3D contents)

※Cost of sound effects: The cost of devices that generate sound effects and the contents of sound effects, a total of approximately US$10,000 is included.

Equipments	1 projector	2 projector
Projector projecting a 10,000 lumen image	US$51,500	US$71,000
Projector projecting a 20,000 lumen image	US$57,500	US$82,000

※Includes 3D animation content and sound effects

- Work is approx. 3 min. long and includes image and sound effects (user defined, MA)
- Rental period of device generating image and sound effect: 3 days (1 day for preparation, 2 days at the event)
- Includes onsite testing and progress management
- Operator and image/sound effect engineer available
- Transport/travel/accommodation fee required for areas other than the Kanto region (Tokyo and the surrounding prefectures)
- Cost of stand and crane rental not included.

Lineup

Product price list

●Software application

※Trial version is available for download from our website. Supported language UC-win/Road：Japanese/English/Korean/Chinese/French　VR-Studio®：Japanese/English

UC-win/Road Ver.10 Advanced (UpGrade)	US$9,700	Including point-cloud modeling, Civil 3D, InRoads, OSCADY PRO, xpswmm, 12d Model
UC-win/Road Ver.10 Driving Sim (UpGrade)	US$12,800	Including ECO drive, drive simulator, micro simulation player
UC-win/Road Ver.10 Ultimate (UpGrade)	US$18,000	Top-level products including all plug-ins※1
UC-win/Road Ver.10 Standard (UpGrade)	US$6,300	Standard products without plug-in options
UC-win/Road Ver.10 Presentation Version (UpGrade)	US$660	Products for multi-driving features synchronizing multiple PCs via network for multiple drivers
UC-win/Road Ver.10 Cluster Client Version (UpGrade)	US$660	Products with presentation features such as visual option tools
UC-win/Road Ver.10 Multi User Client Version (UpGrade)	US$1,180	Product for client PC of cluster option (displays load distribution multi monitor by several PCs)
UC-win/Road Ver.10 Free Viewer (UpGrade)	No charge	This free viewer product allows you to move around the 3D environment as well as play and replay scripts. Supports data output via FORUM8 plug-in.

※1 Additional options (VR-Cloud®, SDK, cluster, motion, RoboCar®) are not included.

●Plug-ins

Plug-in option name	Advanced	Driving Sim	Ultimate	Price	Detailed
Driving Simulator Plug-in	—	○	○	US$3,360	Four-wheel vehicle Drive Simulator Packaging System
ECO Drive Plug-in	—	○	○	US$3,360	Calculates fuel consumption while driving a car
Replay Plug-in	—	○	○	US$1,730	Records the movement of models of vehicles and pedestrians and replay
Log Output Plug-in	—	○	○	US$3,360	Coordinate information, direction, speed and steering angle of a driving vehicle can be output to a log.
Scenario Plug-in	○	○	○	US$1,730	Controls the VR environments in response
Communication Plug-in	○	○	○	US$3,360	Web-based Communication system
Micro Simulation Player Plug-in （VISSIM）	○	○	○	US$3,360	Records and plays traffic simulation
S-Paramics Plug-in	○	—	○	US$800	S-Paramics linkage converting the road geometry data
Point Cloud Modeling Plug-in	○	—	○	US$1,730	VR modeling by using point cloud data for UC-win/Road
Civil 3D Plug-in	○	—	○	US$750	Data linkage with Autodesk's Civil 3D
EXODUS Plug-in	○	—	○	US$3,360	Data linkage with University of Greenwich's EXODUS
GIS Plug-in	○	—	○	US$2,840	Convert GIS format file into UC-win/Road
InRoads Plug-in	○	—	○	US$750	Data linkage with Bentley Systems
OSCADY PRO Plug-in	○	—	○	US$1,180	Data linkage with TRL's OSCADY PRO
SIDRA Plug-in	○	—	○	US$750	Data linkage with SIDRA SOLUTIONS' SIDRA
TRACKS Plug-in	○	—	○	US$1,730	Data linkage with Gabites Porter's TRACKS
xpswmm Plug-in Ver.2 （for Tsunami）	○	—	○	US$3,360	Data linkage with XP Software's xpswmm
Noise simulation Plug-in	○	—	○	US$3,360	The spread of sound is simulated on VR space.
3D Model Output Plug-in	○	—	○	US$800	Output the files of terrain, 3D model, road, tree etc. in 3ds format.
IFC plug-in	—	—	○	US$800	The terrain data in IFC format can be imported
12d Model Plug-in	—	—	○	US$750	Data link with 12 Solutions Pty Ltd.'s 12d Model
Munsell Colour Space Output Plug-in	—	—	○	US$2,320	Convert the scene displayed on the main screen into the "Munsell colour system"
Loading parking model plug-in	—	—	○	US$800	The parking drawing data made by "Parking lot drawing system" can be imported.
UC-win/Road free viewer output plug-in	—	—	○	US$750	Output data file for UC-win/Road Free Viewer.

●Additional options

Noise Simulation via Supercomputer Option	US$180/month
Motion platform Plug-in※1	US$8,600
Remote access Plug-in	US$3,360
VR-Studio® Plug-in	US$750
RoboCar®Plug-in	US$3,360
OHPASS Plug-in	US$5,500
AIMSUN Plug-in (NEW)	US$3,000
Legion Plug-in	US$800
cycleStreet Plug-in (NEW)	US$1,000
Super Computer Cloud® Fluid Analysis Plug-in	US$3,360
Cluster Plug-in※2	U$8,600
3D Point Cloud / As-Built Drawing Management Plug-in	U$3,160
Photo-log Point Cloud Modeling Plug-in (NEW)	US$2,000
Tsunami Plug-in	US$3,360
Debris-Avalanche Simulation plug-in	US$3,360
UC-win/Road DWG tool※3 (NEW)	US$800
Rhino Plug-in (NEW)	US$1,000
Driving training plug-in (NEW)	US$4,000
Kinect plug-in (NEW)	US$2,320
Oculus Rift Plug-in (NEW)	US$500

※1：System Option : To be provided only for system development　※2：Basic configuration: Slave PC 3, Server PC 1
※3：3D Model Output Plug-in" is separately required.

●Price of Maintenance - Support Contract

■Support information　Technical Support by phone / Inquiry by e-mail and Fax / Download / Maintenance information / Technical information　*It is free delivered the version upped product by maintenance contract option

Object Product	Maintenance Contract Option		
	1 Year	2 Years	3 Years
Advanced	US$1,455	US$2,910	US$4,365
Driving Sim	US$1,920	US$3,840	US$5,760
Ultimate	US$2,700	US$5,400	US$8,100
Standard	US$945	US$1,890	US$2,835
Presentation Version	US$260	US$520	US$780
SDK	US$560	US$1,120	US$1,680

●関連製品

VR-Cloud® Ver.5 Standard	US$3,360
VR-Cloud® Ver.5 Collaboration ※1	US$5,500
VR-Cloud® Client Ver.5（Only browsing. Android is applied.）	No charge
VR-Cloud® Ver.5 Flash Version	US$3,360
UC-win/Road SDK Ver.10	US$3,360
UC-win/Road Education Version	US$540
VR-Drive	US$780
UC-win/Road Web Viewer	US$4,200
UC-win/Road Data conversion tool	US$1,430
UC-win/Road data exchange tool for APS-Win	US$1,730
City Design Tool（UC-win/Road 3ds Max Plugin）※2	No charge

※1：VR-Cloud® a3s Standard + Forum function + Slide Presentation function
※2：Provided with the download

●Rental license/ Floating license

■**Rental license :** It's the license based upon the needs of the use for less than a year.License use at a price cheap for a short period of time is possible.

	2 Weeks	1 Month	3 Months	6 Months	1 Year	3 Years
Advanced	US$1,940	US$2,910	US$4,650	US$5,820	US$6,690	US$12,513
Driving Sim	US$2,560	US$3,840	US$6,140	US$7,680	US$8,576	US$16,128
Ultimate	US$3,600	US$5,400	US$8,640	US$10,800	US$11,880	US$22,140
Standard	US$1,260	US$1,890	US$3,024	US$3,780	US$4,788	US$9,009
Presentation Version	US$152	US$231	US$363	US$456	US$528	US$990

■**Floating license :** Use of the latest version is always possible at unspecified PC.

	2 Weeks	1 Month	3 Months	6 Months	1 Year	3 Years
Advanced	US$3,395	US$5,141	US$8,140	US$10,185	US$11,640	US$21,922
Driving Sim	US$4,480	US$6,784	US$10,752	US$13,440	US$15,104	US$28,288
Ultimate	US$6,300	US$9,540	US$15,120	US$18,900	US$20,700	US$38,700
Standard	US$2,205	US$3,339	US$5,292	US$6,615	US$8,379	US$15,687
Presentation Version	US$264	US$396	US$641	US$799	US$924	US$1,736

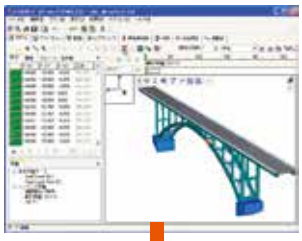
Bridge　Traffic　River

Simulation of Case Studies

Bridge/Tunnel

3DVR is effective for choosing the type of bridge. Designs from such FORUM8 software as "RC substructure design calculation", "UC-win/FRAME (3D)" can be imported as bridge models in "3ds" format. Visual examination of bridge type and color, and shadow analysis with consideration to different times of the day and the times of the year are possible - using the driving simulation, pedestrian view and flight simulator, interactive assessment can be carried out effectively.

▼3DS export
from UC-win/FRAME(3D)



▼Lighting up bridges can be displayed.

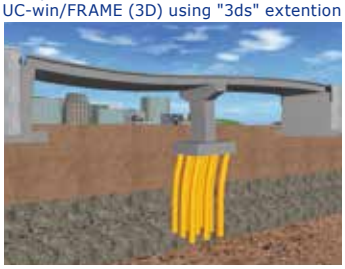
▼Comparison of VR Model with actual photograph
(Left: actual photograph; Right: UC-win/Road Visualisation)

▼Inside the Tunnel

▼Tunnel entrance design

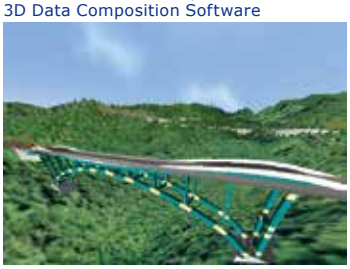
▼Training system for tunnel administrator
via VR (BMIA (France))

▼Import 3D models from
UC-win/FRAME (3D) using "3ds" extention



▼Visual comparison of a bridge before and after the removal
of elevated highway on Shuto Expressway (Nihonbashi River)

▼3D Chimera-GL: Easy
3D Data Composition Software



Traffic

Traffic flow and vehicle profiles can be altered in traffic simulation, which also takes into consideration vertical slopes and the vehicle performance. The traffic after the opening of a new bypass or a large attraction, such as a shopping mall, can be simulated, and linkage with such traffic analysis software as "TRACKS" enables UC-win/Road as a simple visual 3D traffic simulation.

▼12th 3DVR Simulation Contest Grand Prix
" VR Simulation for Traffic Regulation to Divert Traffic During Night Construction "
Iwasaki CO., LTD.

Micro simulation player plugin

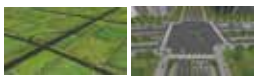
The function to play animation in various types of simulation expressed by the movement of 3D model. The record and play of traffic flow as a result of traffic simulation by UC-win/Road and the others are possible.

OSCADY PRO plugin

Traffic light design software
Automatic setting for layout and alignment of traffic light and optimized traffic light qty and congestion, and gradual and quick optimization of traffic light is possible.

VISSIM plugin

It's possible to read the result of traffic flow analysis of VISSIM and to simulate it.



S-PARAMICS plugin

It's possible to review the scenery, road design, traffic easily by VR of UC-win/Road and to confirm road conditions through the eye-sight of driver by driving simulation.

TRACKS plugin

Land use, Traffic modeling system Plagin which performs presentation by combining traffic analysis result of "TRACKS" of Gabites Porter, traffic model data and UC-win/Road.

SIDRA plugin

VR model automatic creation support tool
It's the plugin to VR express intersection design software and intersection designed SIDRA in VR.

Aimsun plug-in NEW

Vehicle behavior and signal phase from Aimsun can be reproduced real-time within the UC-win/Road 3D environment.

Traffic simulation

Clearing house Japan Society of Traffic Engineers
Inspection points of UC-win/Road is posted
http://www.forum8.co.jp/topic/up68-p4.htm

River

For use in river improvement and maintenance projects, movement of the water and reflection on the surface can be utilized.

Railroads, Harbors/Airports, Parks/Hosing, Cities/Streets

Road Simulation

Railroad Port Park/Town Urban planning

Simulation

Railroads

Just as with the simulation on roads, railways and other mass transit systems can be simulated - flying junctions, underpass, overpass and other structures can be created easily for planning, and for redevelopment of stations, 3D VR is ideal for designing Pedways and other facilities.

▼10th 3D･VR Simuration Contest Grand Prix
"System for checking the position where equipments are installed"
Japan Railway Construction, Transport and Technology Agency

▼11th 3D･VR Simulation Contest Idea Award
"Restoring the Omuta street car in 1952 and the town along its railroad"
Keisuke Ijiri

▼Railway simulation

▼Railway simulation

Harbors / Airports

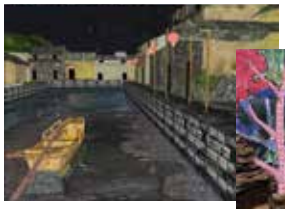
For models of harbors and airports, simulation of a large area is possible with aerial photographs. Sea routes of vessels can be defined, enabling dynamic expression of various vessels. Also, by defining airplanes as flight models, take-offs and landings can be visualized. For coastal and underwater environments, reflection on the water can be visualized and diverse 3D models are available.

▼Yokohama Port, Bay Bridge, and Yamashita Park sample models

▼Take-off and landing of airplanes can be defined by flight paths

▼Take-off and landing of airplanes can be defined by flight paths

▼Coasts and Marinas



▼Underwater models

Parks / Towns

A wide variety of trees are useful for designing parks and housing developments, offering simulations of all four seasons in 5 or 10 years from now. Walk-through of whole development or visualization of various parts is useful.

▼"Simulation for improving the route taken by students going to and from school"
Tatsumi Architects & Engineers

▼"Proposal of Ground facility VR simulation"
Asunaro Aoki

▼3D Digital city
Shinano-Omachi

▼City and Architecture blog
Santorin

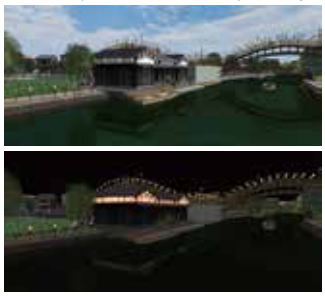
▼"BANJAR　water park"
FUJICON PRIANGAN PERDANA, PT

Cities / Streets

Urban planning

When designing parks and streets, the simulation is ideal for deciding where to plant trees and which trees to plan, since all of the four seasons in 5 or 10 years from now can be visualized. For redevelopment of streets and other public spaces, 3D traffic simulation and dynamic city simulation with 3D human models are ideal. Using the artificial light feature, the cityscape at day and night can be evaluated.

▼Landscape assessment of day and night



▼"City design･VR application for consensus formation toward landscape formation of Kobe" Kobe City

▼11th 3D･VR Simulation Contest Essence Award
"Simulation for urban planning in front of Hokuriku Shinkansen "Iiyama station"
Iiyama city Construction channel department City planning section/Section for maintening the surrounding of the station of Shinkansen bullet train

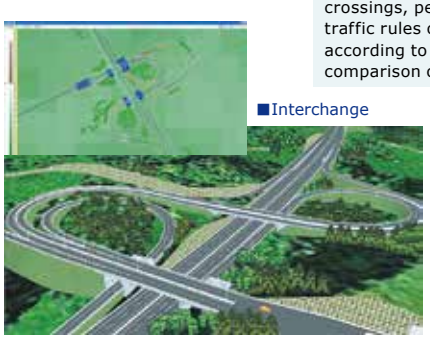
▼11th 3D･VR Simulation Contest Excellence Award
"Simulation for a landscaping plan using point cloud data"
Kyushu-orient Servey&Design Co., Ltd.

Road Simulation

Simulation of Case Studies

Road

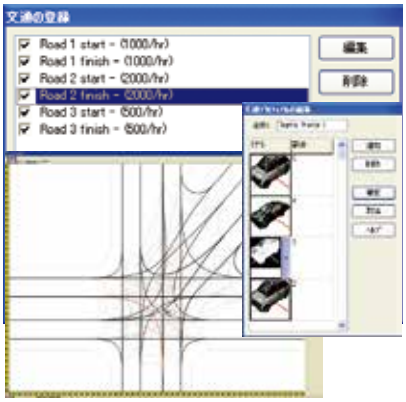
For evaluation of slope designs, such as cutting and banking of the road and small ramps, simulations from inside and outside the vehicle with variable traveling speed are available. Using the wide range of functions available, it is possible to generate pedestrian crossings, pedestrian bridges, tunnels and bridges easily, and to visualize in detail complicated shapes, textures drive paths and traffic rules of junctions, and the On/Off ramp feature allows quick creation of intricate interchanges. Traffic profiles can then be set according to hourly traffic volume and vehicle type and the traffic simulation can be used to visualize the congestion of roads and comparison of traffic condition in a road network with and without bypass projects.



■Interchange

■Rotary

▼Traffic Generator / Traffic Flow Traffic is generated according to vehicle type ratio and hourly traffic volume to produce a traffic flow that allows collision prevention. From the top, hourly traffic volume by drive path, configuration screen for ratio of car types, and drive path.



▼11th 3D･VR Simulation Contest Community Development Prize
"CAiming for "Alleviating traffic jams in the original route especially near railroad crossings and narrow bridges"
Nishitetsu C.E. Consultant Co., Ltd

▼10th 3D･VR Simulation Contest Design Award
"3D VR modeling of the Hunter Expressway"
By Roads and Traffic Authority of NSW (RTA)

▼Comparison of VR Model with aerial photograph of the Tokai Circular

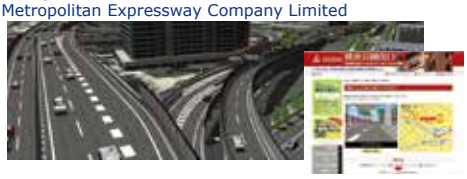
▼9th 3D･VR Simulation Contest Grand Prix
"Proposal of underground installation of Hanshin expressway and improved city using VR"
Faculty of Policy Studies, Kansai University

▼8th 3D･VR Simulation Contest Grand Prix
"Ohashi Junction of Metropolitan Expressway"
Metropolitan Expressway Company Limited

■Comparison of VR Model with actual photograph

▼Comparison of VR Model with actual photograph of the Hokusei Bypass

▼6th 3D･VR Simulation Contest Grand Prix
"Ishikawa-cho Junction Simulation"
Kanagawa Construction Bureau,
Metropolitan Expressway Company Limited



▼5th 3D･VR Simulation Contest Grand Prix
"Construction Simulation of Daishi Junction and Daishi Ventilation Facility"
Kanagawa Construction Bureau,
Metropolitan Expressway Company Limited

Construction/ Display Simulation

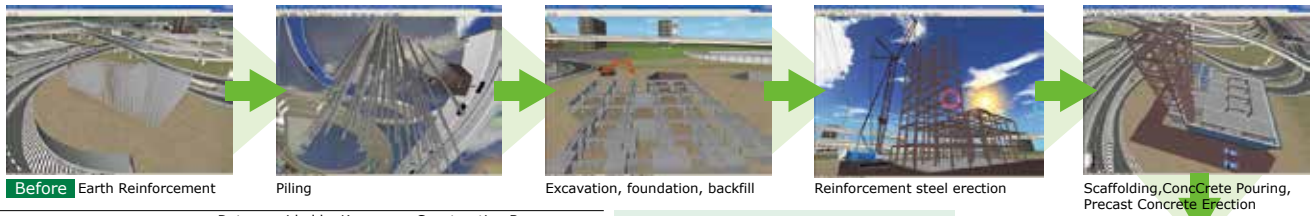
3D Model

By using standard models, data can be created effectively, allowing use of the model editing tool and dynamic settings of the models easily. Models from UC-1 design series other UC-win programs can be imported and 3DS models from other programs can be used.

Construction machinery For the 3-D models of heavy machinery, over 100 types of construction machines from Hitachi Construction Machinery Co., Ltd. are supported as moving models.

Construction Simulation

UC-win/Road can be used for 3D construction simulation of land reclamation, erection of temporary structures, underground electric wire installation, visual examination of pedestrian overpass removal and construction simulation with moving models - there are 3D models of heavy machineries with moving parts available. UC-1 series temporary works and ground 3D model are also available.



Before Earth Reinforcement

Piling

Excavation, foundation, backfill

Reinforcement steel erection

Scaffolding,ConcCrete Pouring, Precast Concrete Erection

Exterior and Curtain Wall

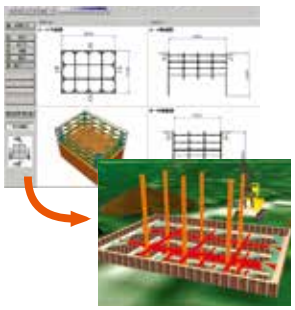
After Dismantling of scaffolding and waterproofing the roof and completion

Construction Stages Data provided by Kanagawa Construction Bureau, Metropolitan Expressway Company Limited

1. Earth retaining/ ground improvement: drive a sheet pile and a ground reinforcement pile.
2. Pile compaction: driving a PHC pile and a SC pile with pile driver.
3. Excavation/foundation/backfill: excavation with backhoe and foundation compaction
4. Reinforcement steel erection: reinforcement steel erection with 100t crawler crane
5. Erection of scaffolding/Pouring Concrete/Precast Concrete erection: SRC skeleton completed
6. Finishing Exterior wall/curtain wall erection: exterior finishing work
7. Dismantling scaffolding/waterproofing the roof/exterior/completion: finish dismantling scaffolding

▼Bridge construction

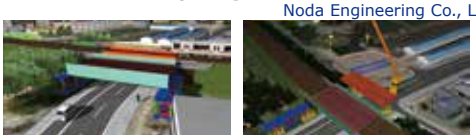
▼UC-1 Temporary sheathing work design 3D model utilization



▼Movable model, Before/After, Several constructions can be simulated with script function.

▼12th 3D･VR Simulation Contest Engineering Award
「Proposal of a New Engineering Method for Installing Single Track Railway Bridges」
Noda Engineering Co., Ltd.

▼8th 3D･VR Simulation Contest Idea Award
「Simulation of Railway Bridge Beam Construction Work」
Noda Engineering Co., Ltd.



Display Simulation

20th 3D&VIRTUAL REALITY EXPO
Jun 20 - 22, 2012 Tokyo Big Sight

The 3rd ROBOTECH
July 11-13, 2012 Tokyo Big Sight

▼Evacuation simulation in an exhibition site

Data can be seen in "Experience on VR-Cloud®" page!
http://www.forum8.co.jp/product/ucwin/VC/VC-taiken.htm

FORUM8 Design Festival 2012-3Days venne Navigation (Sep 20 - 21,2012)

Proposal

HEAD MOUNT DISPLAY

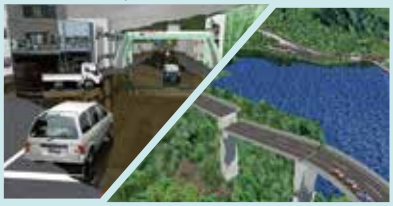
VR application / proposed examples

Disaster prevention VR

The 3-D disaster representation of presentation is possible for disaster prevention such as "flood" simulation by water level alternation feature and traffic simulation with road failures.

▼3-D tsunami simulation

▼Flood, earthquake disaster simulation



▼「Debris avalanche simulation」
Gunma University Engineering Department

▼3-D hazard map sample model

▼Simulation for landslide disaster in Suzawa district of Shinshiro city, Aichi prefecture
Fukui National College of Technology

▼Debris-Avalanche simulation

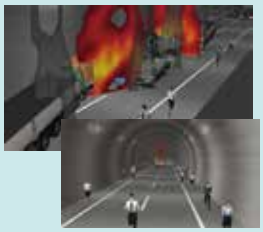
Evacuation Fire VR

Advanced Evacuation/ Fire VR simulation has been available by linking with the evacuation software "EXODUS/SMARTFIRE"developed by the Fire Safety Engineering Group at the University of Greenwich.

Calculation method by evacuation analysis EXODUS is certified as Evacuation calculation method certified by Tokyo Fire Department".

▼Flight accident

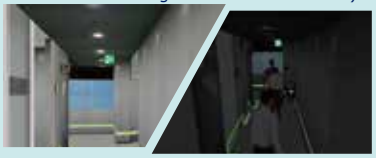
▼Tunnel fire



▼High-rise building fire

▼「Evacuation simulation of Hongqiao traffic networlk center building」Shanghai T.E.F Building Safety Consulting Co.,Ltd (China)

▼The new simulation standard of a Chikko type evacuation guidance system(Chief of Standard Planning committee: Yukio Ota)



▼Training system for tunnel administrator via VR BMIA(France)

Forum8 won "International tunnel award"

FORUM8.Co, Ltd. won the award under the category Safety Initiative of the Year in the "2011 NCE International Tunnelling Awards" with BMIA, France, on December 1st, 2011.

Medical VR System

Solution in a hospital and medical front using 3DVR

Introduction and its purpose of VR
- ■Improvement of medical front
- ■Communication with local community
- ■Share new design concept with staffs and hear their requests Energy saving and environment-friendliness
- ■Secure the clear materials to make some decisions and risk management strategy

▼Review and confirm the image of the hospital's interior

Traffic accident VR

VR is very useful for the simulation of accidents

▼Traffic accident simulation

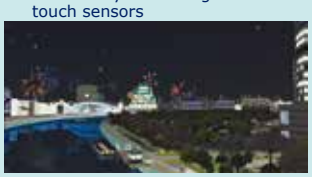
▲3D Modeling by VR based on accident record, etc.
(Provided by Keio University)

Tourism VR

It can be used for tourist project proposals with exhibition systems and publications using VR.

▼Use VR for tourist information and history presentations

▼Exhibition system using touch sensors



▼「Driving simulator for PR of EV vehicle and battery charging system on SmartGrid」SK Energy Co., Ltd.

Store planning simulation

▼Comparative approach to visibility of signboards using VR simulation
Graduate School of University of Tokyo

1.Flow line plan of people and vehicles (large-scale store)
2.Building and Parking arrangement plan
3.Green space plan (large-scale store)
4.Lighting plan
5.Advertising pillar / billboard arrangement plan
6.Simulation including surrounding roads
7.Flow line plan of inside the store
8.Security guards arrangement plan

VR System

We are also developing the customized system including the hardware with a core of UC-win/Road technology such as various kinds of driving simulator, VR simulator, ITS simulator, walking simulator and GIS system etc.

■**System supporting hardware**
Tracking sensors Face mounted display 3D stereo viewing

▼Driving Simulator
(Hamagin Space Science Center, 2009)

▼Driving Simulator
(Toyota Auto Salon Amlux Tokyo, 2011)

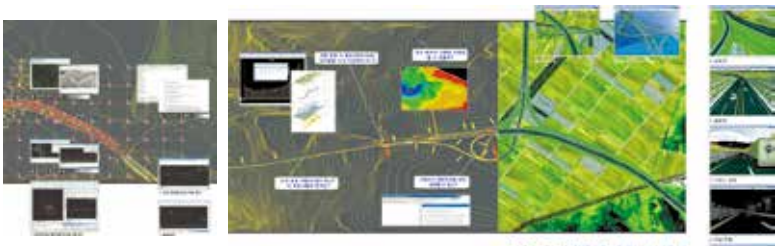
▼Driving simulator for highly sophisticated research purposes
(Kyushu University, 2012)

▼Driving simulator for highly sophisticated research purposes
(Kyoto University, 2012)

▼Driving Simulator for seniors
(Meijyo University, 2012)

Examples from overseas

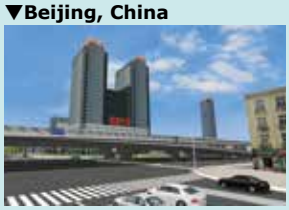
Oversea users have been utilizing UC-win/Road VR. It has been introduced in design companies, engineering companies, government agencies, universities and research institutes, and further projects are in the pipeline.



▲Korea/CAD&VR utilization cases
Road Projector - Civil 3D - UC-win/Road

▼Shanghai, China

▼Beijing, China



▼Hong Kong

Global Dealer Network
International Partners / International Offices / Dealer network

FORUM8 Technology Development (Shanghai) Co., Ltd
Offices: Sydney, London, Korea
Overseas Agencies: China (Beijing, Tianjin, Dalian, Shenzhen, Hong Kong, Taiwan), Korea, USA etc.

▼Brazil

▼Paris, France

▼Kuala Lumpur, Malaysia

▼New York

▼ New Zealand

▼Hanoi

▼Thailand

▼Bahrain

▼Korea

▼Taiwan

▼Venice

▼Strasbourg

▼Santorin, Greece

Series "City and Architecture blog"

"City and Architecture blog" by Mr. Tomohiro Fukuda is carried in Up&Coming. FORUM8 staff challenges to model 3D digital city based on his article. Please enjoy it!

http://www.forum8.co.jp/topic/toshi-blog0.htm

【Profile of Mr. Tomohiro Fukuda】

Born in Kakogawa-shi, Hyogo prefecture in 1971. Associate professor/dorctor (Eng.) in Graduate School of Engineering, Osaka University. He majors in the Environmental Design and Information Technology. He has joined domestic/international research/design projects such as Patio Design in Takamatsu, Kobunaki Eco village in Omihachiman and Next Gene 21+ in Taiwan. He is also a large physical model production member of the Aqua metropolis Osaka for Tadao Ando Architectural Exhibition 2009, an executive board member of the Non Profit Orgamization Alternative Tourism Club, and a tourist guide of Osaka community-based tourism. He won the highest award of the Kobe lighting design competition (2001). Book: "VR Presentation and New Urban Development"

Blog:http://fukuda040416.tumblr.com/

▼Vol.26 Germany : Freiburg and Goslar

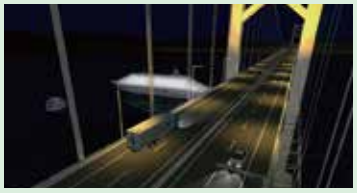
▼Vol.25 Northern Switzerland : Zurich and Weil am Rhein

▼Vol.24 Volos and Athens : Beautiful small plaza

▼Vol.23 Netherlands : Delft

▼Vol.22 Singapore : City-state of right on the equator

▼Vol.21 Setouchi : Naoshima



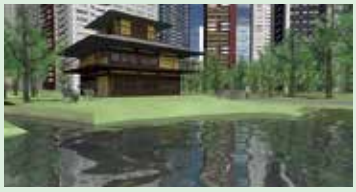
▼Vol.20 South India: Chennai

▼Vol.19 Austria: Newcastle

▼Vol.18 HongKong and Guangzhou: Zhujiang delta

▼Vol.17 Itako and Sawara: Chiba and Ibaraki

▼Vol.16 Brazil: Curitiba



▼Vol.15 Peru: Machu Picchu

▼Vol.14 Texas: Kimbel Museum

▼Vol.13 Japan: Kobe city

▼Vol.12 South Korea: Cheju Island

▼Vol.11 Germany Hamburg

▼Vol.10 Strasbourg : Tram and town planning

▼Vol.9 Oumihachiman

▼Vol.8 Venice : Town of water network

▼Vol.7 Santorin, Greece : Aegean white village

▼Vol.6 Bahrain : Island nations in the Middle East

▼Vol.5 Shinanoomachi : Take advantage of sump water of North Alps

▼Vol.4 India : Taj Mahal

▼Vol.3 Sydney : The most beautiful harbor in the world

▼Vol.2 Taiwan : The often-visited country

▼Vol.1 Osaka : Aiming to be "City of water"

Use of the 3-D-based visual tools, which is the easiest tool for improved basic designs, consensus building with residents, and improved accountability for public projects, will be a standard design approach in the near future. UC-win/Road has already been utilized as a standard tool by users in diverse fields.

User introduction Up&Coming

Excerpts from our public relations magazine user introduction
(Used by many recipients for sophisticated purposes)

Results Up&Coming No.49-No.105

Vehicle Information and Communication System Center (VICS Center)

http://www.vics.or.jp/

VICS - Supports Safe and Comfortable Driving Through Vehicle Information Realizes VICS-DS for a New Service Based on UC-win/Road-DS

- Progress for 16 Years and Current System
- Outline and new services of VICS
- Development Stream of VICS-DS

Educational Institute and Foundation

Korea Transport Institute. (KOTI)

http://english.koti.re.kr/

A Think Tank Supporting the Korean Transport Policy Focuses on Advanced and Diverse Challenges about Highways

Introducing UC-win/Road as a Part of Positive Application of IT, KOTI Widens VR Applications through Using it in Practice in Plural Projects

- Overview of KOTI and the New Current of the Transport Policy
- Recent Research Themes for Center for Advanced Transportation Operation Research
- Process of Introducing UC-win/Road and a Variety of Specific Cases

Japan Construction Method and Machinery Research Institute, JCMA

http://www.cmi.or.jp

Using UC-win/Road, JCMMRI Was Able to Address 3-D Display Technology of Information for Construction Robot, Expanding Availability of 3-D Real-time VR

- Researches and development commissioned by public organizations
- Examining visions, formulating procedure plans, and ISO standardization for intelligent construction
- Treatment of 3-D data and interface with the human will be the key for Construction robot

Public office • Local government

Kobe Enterprise Promotion Bureau NEW

Kobe City Government http://www.city.kobe.lg.jp/business/attract/

Making Efforts in Invitation of Enterprises and Industrial Promotion through Spreading Simulation Using Supercomputer. Utilize UC-win/Road Data for Urban Plan Also in Activities of Inviting International Conferences

- Urban Strategy with Emphasis on Design, New City Administration Drawing Attention
- Working Both for the City and FOCUS, KEPB Supports Industries with the Supercomputer
- Diverse Ways of Using VR, Cooperation with FORUM8 Evaluated
- Towards Wider Dissemination of Simulation

Construction and Water Department, Iiyama City, Nagano Pref.

http://www.city.iiyama.nagano.jp/

Town Planning Section / Shinkansen Station Area Development Section

Expectation Rises Towards Opening of "Iiyama Station" of Hokuriku Shinkansen (the Bullet Train) Along with Town Planning in Progress Simulation with UC-win/Road Is Used for Study in the Office and Public Relations

- Environment of the City and Positioning of the Hokuriku Shinkansen: Active climate in introducing ICT
- Possibility of VR Focused on Use of UC-win/Road
- From the New Station Circumference to Design of Town Planning

Himeji City System Management Div., General Affairs Dept., Mayor's Office,Street Construction Div., Road Dept., Construction Bureau

http://www.city.himeji.lg.jp/

To Emphasize Development of Environment for Utilizing IT on a Agency-wide Scale in Accordance with the Master Plan and Computerization Plan of the City

- Focusing on the potentiality of 3D Space Simulation, the Tool Supports Examination of Various Projects in Relation with Historical Resources Including Himeji-jo Castle, a Cultural Site of World Heritage

- Towards Town Planning in Consideration of Regional Characteristics Including Himeji-jo Castle
- Idea of Utilizing 3D Space and the Role of Internal Communication Section

National Agency for Automotive Safety & Victims' Aid Safety Guidance Department

http://www.nasva.go.jp/

To Aim at Contributing to Realizing Secure and Safe Society Through Automobile Accident Prevention and Support to Victims

- "NASVA Net", Internet Aptitude Diagnostic System Using 3D VR-based Driving Simulation Diagnosis as Its Core, Has Started Its Service

- "Preventing, Supporting, and Protecting" as the Mainstay of the Services of NASVA
- The Existing Constraints and the New System Development of VR Application in an Aptitude Diagnostic System

Highway Industry Development Organization

ITS Research & Management Division Project Promotions Department http://www.hido.or.jp/

"Smartway" to Direct the Course of Next-generation ITS Society

- Fresh Potential of 3D VR and DS Shown in the Experience Demo of New Services

- Investigating Development and Practical Application of State-of-the Art Technologies Related with National Road Policy
- Progress on ITS and Position of Smartway
- Outline of "Smartway 2007 Demo"
- Towards ITS deployment in the future

Shikoku Regional Development Bureau, MLIT

Matsuyama Office River and National Highway http://www.skr.mlit.go.jp/matsuyam/

Simulation by 3-D Real-time VR Makes a Difference At Local Meetings and the Open House

- Covering the river Shigenobu and the Ishite, and main national highways in Chuyo and Toyo region
- New congestion mitigation measure in Matsuyama urban area - Matsuyama Outer Ring Road Project
- Operating a driving simulator using "Road", diverse availability is noted

Kanazawa University
School of Environmental Design, College of Science and Engineering, Laboratory of Structural Engineering / Laboratory of Urban Planning http://www.ce.t.kanazawa-u.ac.jp/env_home/

Having a Tradition of Setting a High Value on Computational Science, Kanazawa Univ. Also Focuses on Analyses in Many Different Areas. They Use Advanced Analysis and VR Technologies for Bridge Structural Issues and Support for Urban Planning

- Evolving into a System to Encourage Strategic Research
- Lab. of Structural Engineering Has Been Using Dynamic Non-linear Analysis Software for Years, with New Use in Mind Collaboration with FORUM8 Expected to Use Their Original Program in Addition to Development of ESB/ERB
- Laboratory of Urban Planning Focuses on Development and Application of Public Involvement Support System Aiming to Construct a New System Based on VR-Cloud®

University of the Ryukyus
http://suikou.tec.u-ryukyu.ac.jp/

Hydraulic Engineering Laboratory, Department of Civil Engineering and Architecture, Faculty of Engineering

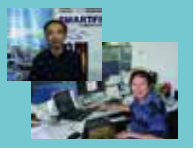
With Response to Tsunami Waves as its Urgent Task, University of the Ryukyus Also Contributes to Oceania Aiming at Advanced Analysis and Simulation in Combination with Mini-supercomputer

- Positioning of the Hydraulic Engineering Laboratory and Its Activities
- Laboratory Supporting Research Utilizes ICT
- They Place Expectations on FORUM8 Products for Realizing Contribution to Oceania
- Integration of the Super Disaster Mitigation Map and Simulation Technology

Tongji University
http://www.tongji.edu.cn/

State Key Laboratory for Disaster Reduction in Civil Engineering

Building EXODUS and UC-win/Road used for the disaster-prevention measures of public transportation system in Shanghai



- Tongji University which is strong for civil engineering and the town of Shanghai
- Also exchange with Professor Gaul of the University of Greenwich
- The large-scale infrastructure which cannot respond by the conventional manual
- Exchange the data of building EXODUS with Professor Gaul etc.

The University of Tokushima, Graduate School, Institute of Technology and Science
http://design-lab.vis.ne.jp/

Faculty of Engineering, Department of Civil and Environmental Engineering, Urban Infrastructure Design Lab

Towards Development of Information-presentation Technology for Bicycles Suitable for Visibility Characteristics of the Users.Introduced a Bicycle Simulator Based on UC-win/Road

- Positioning of the Urban Infrastructure Design Lab.Flow of Research with bicycles as its Core etc.

Fukui National College of Technology
http://www.fukui-nct.ac.jp/~arc/

Region cooperation technology center Environmental and urban engineering departments Spatial Information Engineering Laboratory

UC-win/Road as a new field of spatial information is focused on and it was adopted to lecture in class. The new VR course started and our emplayee was in charge of the extraordinary professor

- The training base of research-and-development typed engineer training to which more than 1000 students gather
- The high successful rate for obtaining job etc.

Tokyo University of Agriculture
http://www.nodai.ac.jp/

Lab. of Landscape Engineering, Dept. of Landscape Architecture Science, Faculty of Regional Environment Science

Ever-expanding Applications of "OHPASS", an Optimal Highway Path Automatic Search System
-Capable of Linking with 3D CAD, Expanded DM, and 3D VR etc.; Diverse Research To be Developed Based on "JHDM" as a Solution for Landscape

- "Landscape" as a Key to Trend Around Landscape Construction Engineering Etc.

College of Science & Technology,Nihon University
Transportation System Lab., Dept. of Transportation Engineering & Socio-Technology http://www.trpt.cst.nihon-u.ac.jp/TRSYSTEM

Concept of Utilizing IT Is "Having Unique Technology" and "Serving the Society"
- Introduction of "UC-win/Road" into the Social Experiments in Okinawa is a Part of It

- IPutting an Emphasis on Transportation Problems in Southeast Asia, with Free Use of Mathematical Methods
- VR Bringing Out diverse effects on simulation of landscape assessment items

Meijo University
http://www-is.meijo-u.ac.jp/

Dept. of Information Engineering, Faculty of Science and Technology,

Based on the Keyword of "Only One" and "Serve the Society" rather than studying for study, -They Aim for Developing a Driving Ability Judgment System for Aging Society

- Dept. of Information Engineering Leading ITS Researches in Various Fields
- ITS Approaches from "Image Information Processing" and "Human Interface"

Kyoto University
http://www.um.t.kyoto-u.ac.jp/ja

Logistics Management Systems Laboratory / Intelligent Transport Systems Laboratory, Department of Urban Management, Graduate School of Engineering

Towards Establishing Sustainable, Safe and Comfortable Transport System with International Competitiveness Realizing Advanced Driving Simulation Experiment by Connecting Various Kinds of Functions to DS for High-level Studies

- Changes in Department of Urban Management and Its System
- Logistics Management Systems Laboratory Studying Urban Logistics Systems with Unit for Liveable Cities
- Intelligent Transport Systems Laboratory ICT is Essential for Smarter Use of Transport System
- Limits of Experiments in a Real Car and Needs for DS

Tianjin University
http://www.tju.edu.cn/

Faculty of Management and Economics

Analyzing the driving actions of Chinese driver by driving simulator. UC-win/Road reflecting characteristic traffic condition is requested as well.

- On-the-ground research for Forum 8 users
- UC-win/Road and drive simulator are frequently used in Tianjin University
- Traffic actions are studied in Tianjin where a traffic infrastructure are improving promotly.
- To the new research tool which can analyze the action of many drivers
- UC-win/Road is chosen by the quality and easy usage of graphics etc.

Seoul National University
http://gses0.snu.ac.kr/eng/

Transportation Management LAB., Graduate School of Environmental Studies

From Vehicle behavior to Pedestrian Behavior Simulations, with Further Development in Mind
- Developing Unique Algorithms Through a Joint Project among Industry, University, and Laboratory, and Focusing on the Possibility of UC-win/Road as a Visualization Tool

- Positioning of GSES and the Transportation Management LAB
- Developing a Pedestrian Simulator for Analyzing the Operation of the Transfer Center
- Linking a Pedestrian simulator with UC-win/Road

University of Tsukuba
http://www.css.risk.tsukuba.ac.jp/

Laboratory for Cognitive Systems Science, Department of Risk Engineering, Graduate School of Systems and Information Engineering

Towards Designing New Ways of Human-automobile Interaction Through Forecasting and Controlling Risks
- Aiming to Build an Appropriate Support Method from Detecting and Estimating Drivers' Conditions with Free Use of Various Sensors and DS's

- Position of the Lab and its Research Topics
- Putting Weight on Collisions in His Own Research etc.

Kakogawa Higashi High School
http://www.hyogo-c.ed.jp/~kakohigashi-hs/

Kakogawa Design Group, Super Science High School

High School Students to Challenge Design Proposal of the Local Shopping Center as One Part of SSH Projects Designated by MEXT
-Expressing Functions They Expect in the Area with 3D VR Under the Guidance of a Regional Advisor Tomohiro Fukuda, Associate Professor of Osaka University

- Kakogawa Higashi High School and SSH project
- The Story Behind Grappling with Subject Research "KAKOGAWA Design"

Hosei University
http://www.edn.hosei.ac.jp/top.php

Dept. of Civil and Environmental Engineering, Faculty of Engineering and Design

Educational and Research Base for Fusing Engineering and Aesthetics to Propose Design of the Next Generation
-Putting Emphasis on Visualization Education, the Dept. Has Started to Use 3D-VR to Examine Urban and Regional Renovation-

- Design-related Areas Are Integrated into New Faculty; Its Base Has Moved to City Core at the Same Time

Gunma University
http://www.ce.gunma-u.ac.jp/w3-admin_skd

Dept. of Civil and Environmental Engineering, Graduate School of Engineering

Shifting from "University (Faculty)"-centred Organization to "Graduate School"
-centred One, with Higher Needs, as well as Vigorously Promoting Works that Contribute to Regional

- Research Area Shifts from "Civil Engineering" to "Civil and Environmental Engineering" to Reflect the Times
- Efforts of Each Laboratory and Various Numerical-analytical Approaches

Daido Institute of Technology
http://www.daido-it.ac.jp/

Noticing Effectiveness through Research of Streetscape Evaluation Approach, Introducing 3D Real-time VR (Virtual Reality) in Classes

- Improving the Environment for CAD, GIS, and VR from the Viewpoint of Vocationalism
- VR Bringing Out diverse effects on simulation of landscape assessment items
- We expect that VR would be utilised for large range of our lecture.

Professor Fumihiko Imamura (Tohoku University) x Professor Edwin Galea (University of Greenwich in the UK) [New Year 2013: Special interview]

How can we harness our latest findings on tsunami and evacuation analysis to come up with disaster prevention solutions?

Professor Imamura who is analyzing tsunami via Supercomputer K, and Professor Galea, an authority on evacuation analysis, consider the prospect.

March 11th 2011 East Japan Earthquake triggered a major tsunami that inflected a damage so big that many call it the kind of damage seen only once in a thousand year cycle, leading to higher awareness of tsunami, and increasing the need for tsunami measures. The Supercomputer K calculates the wave height of tsunami that is likely to occur in the future as well as the extent of inundation due to the disaster, on a daily basis. A research on the most effective way of setting off an alarm to announce an evacuation order taking into consideration people's ability to recognize information, and the lifestyle/customs of residence, as well as a research on large-scale evacuation simulation are being conducted in order to minimize the number of victims due to future tsunami. Professor Imamura, head of International Laboratory of Disaster Technology in Tohoku University and a pioneer in tsunami research, and Professor Galea, an authority on evacuation research and an honorable professor of University of Greenwich, had an extensive discussion on their future research plan . (Interviewer: Ryota Ieiri, Construction IT Journalist)

Road company

East Nippon Expressway Co., Ltd.

http://www.e-nexco.co.jp/

ETC Management Division, Operation Div.

Covering from the Spread of ETC to Traffic Safety Measures: Using the Highway Driving Simulator as an Approach to Improving Safety

- Positioning and Activities of ETC Management Division
- Developing DS Based on UC-win/Road to Enlighten Traffic Safety
- Expectation towards Expanding Possibility of Utilization

Metropolitan Expressway Company Limited

http://www.shutoko.jp

Kanagawa Construction Bureau

Simulation of Travelling and Construction of Daishi JCT and Daishi Ventilation Station Demonstrated the Potential of Complex VR Representation of Buildings and Civil Engineering Structures

- Tunnel Section of "Trans Kawasaki Route" is Under Construction to Be Open in the End of 2008
- Team System supports Stance to Make the Best Use of IT
- Background of Adopting 3D-VR and its Secondary Effect at Daishi Ventilation Station

Central Nippon Expressway Company Limited.

http://www.c-nexco.co.jp/

Atsugi construction office

Atsugi construction office was opened for reconstructing of Tomei Expressway (Atsugi to Oimatsuda) in 1987. After finishing the reconstructing of Tomei Expressway, they deal Second Toukai Expressway.

Aisin Seiki Co., Ltd. (AISIN) NEW

http://www.aisin.co.jp

The 2nd ITS Group, The 1st Electronic Engineering Dept.

AISIN Proposes Solutions for Realizing Sustainable Community That Are Safe and Enjoyable Simulator to Offer Near-Future ITS Experience Built up with UC-win/Road

- Expanding Global Network and Business Fields

AISIN will reach its 50th Anniversary Next Year

- UC-win/Road Introduced in DS for "ITS World Congress Busan 2010"
- DS Design Renewed in "ITS World Congress Tokyo 2013" Functions Upgraded to Get Real Feeling of "Contact Between People and Automobile in the Near Future"
- Needs for DS and its Future Possibilities of Use

Construction Company

FLOVEL CO., LTD. NEW

http://www.flovel.co.jp

Application System Development Group

Experienced in Developing Applications Using Advanced Video and Image-related Technologies. FLOVEL Adopted UC-win/Road to Reinforce Functions of Virtual Cycling System

- Enhancing from Video and Image Equipment for Measurement to Diverse Application Systems
- Shots of the Space and Deep-sea with Ultra High-sensitive Cameras Creating a Sensation on TV Also Putting Efforts into Development of Radioactive Substance Visualization and Biotechnological Products
- Towards Development of New Version of the Virtual Cycling System Improved a Sense of Reality Using UC-win/Road

Alpine Electronics, Inc.

http://www.alpine.com

HMI Advanced Development Team, Advanced Development Dept.

Using Biological Signals for Developing In-vehicle Devices to Consider Driver Distractions Constructing a Unique Evaluation System on the Basis of UC-win/Road DS

- Responding to the Needs of the Next Generation with a Wide Range of In-car Devices
- New Research System Focuses on HMI of In-car Devices
- Concept of DD Evaluation and System Development
- Use and Potentiality of the Evaluation System

Toyota Motor Corporation

http://www.toyota.co.jp/jp/tech/its/

Strategy Planning Dept., IT & ITS Planning Div.,

TS Vision Painted by an Automobile Manufacturer Towards Actualization of a Sustainable Mobility Society

- Approach with Autonomous and Vehicle-Infrastructure Cooperative Systems Taking a Concrete Form With Focus on DS of 3D VR as a Prerelease Trial Tool of Services -

- Current of ITS Promotion and Efforts of TOYOTA
- 3D VR Trial Simulator Installed at The 15th World Congress on ITS (NY)

Asahi Kasei Construction Materials Corporation

EAZET Sales Dept., Foundation Systems Div

To Precede in Pile Construction Having Properties of Low Noise, Low Vibration, and No Surplus Soil Corresponding to Narrow Sites 3D and VR to Be Applied to Explain EAZET Construction Method

- A Rotational Pile Construction Method with a Small Caliber Steel Pipe -

- Harnessing Organizational Power, Technological Development and National Expansion Are Their Strong Points

Consultant

PACIFIC CONSULTANTS CO., LTD. NEW

http://www.pacific.co.jp

Structure Dept., Transport Infrastructure Division / Transportation Planning Dept., Management Division

Accumulated CIM-related Elemental Technologies Including Simulation. Emphasis on Tsunami Evacuation Simulation, Making Best Use of Expertise in the Transportation Field

- Leading the Industry in Wide-ranging Fields After the 60th Anniversary of Foundation
- Forming an Original Strength Based on ICT
- Structure Dept.: Setting FORUM8 Products as the Basis
- Transportation Planning Dept.: Towards Development of Tsunami Evacuation Simulation Based on Accumulated Expertise in Transportation Systems
- Future Response Based on Practical Use of CIM

Kokudo Kaihatsu Center Co., Ltd. NEW

http://www.kokudonet.co.jp

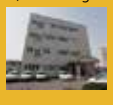
To Make Effective Use of Advanced ICT Placing Weight on BCP Kokudo Increases Shifts to FORUM8 Products After 1996 Revision of Specifications For Highway Bridges

- Kokudo Develops a Professional Engineer Group Based on Institute for Technological Development
- Using ICT Positively While Considering Security
- New Structure of Design Department and Development of Diverse Technologies
- History of Using FORUM8 Products, Evaluation of them, and the Future Prospect

Zivil Investigation Design Ltd. NEW

http://www.zivil.co.jp

To Make Differentiation to Changing Consulting Service Environment Using Original Technique. Zivil Introduced Diverse FORUM8 Products, Needs for Using Them Becoming More Sophisticated



- Achievements Accumulated in a Wide Range of Services, Switching Weight to Inspection, Repairs, and Reinforcement
- Systems Developed Using ICT such as GIS
- Zivil Uses a Variety of FORUM8 Products, with New Expansion in Mind

KITAKEN Consul.Inc NEW

http://www.kitaken.co.jp

KITAKEN Produced Plentiful Results in Sounding, Currently Making Efforts in Extending Life of Structures. Uses of Software to Shift from Bridge Design to Seismic Design and Repair Design

- A General View of a Half-Century Since Its Foundation and the Current Status
- Utilizing Advanced Technology in Sounding Increased Emphasis on Approaches to Extension of Life of Structures
- Use of Forum8 Products to Be Advanced, With New Needs and Demands
- Significance and Security of Data Consciousness of Engineers to Be Required

Designing Division, Koriyama Sokuryo Sekkei (survey design) Co., Ltd.

http://www.gunsoku.co.jp

Keen Hope for Early Resolution of the Nuclear Plant Accident.Actively Proposing Plans by Making Full Use of Functions of UC-win/Road Since its Introduction

- Oriented to the Local Community and Committed to Volunteer Activities.Introduced Child Care Aid Package Ahead of Other Companies in the Prefecture
- Damage to Part of the Company Building and the Server due to the Earthquake Disaster etc.

Kikuchi-giken Consultant Co., Ltd.,

http://www.k-giken.co.jp

Those Left Behind Cooperate to Restore the Region with the Scar of Tsunami Wave Flood Simulation etc. Made with UC-win/Road Before the Earthquake

- Experiences in a Wide Range of Civil Engineering Design Mainly in Iwate Pref. The Network Between Bases Managed in the Headquarters
- The Server recovered, though the First Floor of the Headquarters Building Submerged
- UC-win/Road Introduced for Explaining Outline Design of a Highway Expanding to Diverse Structures
- Lessons Towards Data Management Thoughts for Reconstruction

IDEA Consultants, Inc.

http://www.ideacon.jp

To Take Charge of Ground-related Services as an Integrated Consultancy Firm with Outstanding Specialty in Fields of construction Environment

-Reflecting Positive Commitment to Advanced Technologies with an Effective Use of 3D Dynamic Nonlinear Analysis and 3D VR Tools

- Merged in 2006, Specialized Technologies for Environment and Construction Integrated etc.
- Putting Their Energies into Utilizing VR in Highway Projects After Introducing UC-win/Road
- Adopting Several Tools Including UC-win/FRAME (3D) for Bridges
- Future Development Regarding Highways and Bridges

Nippon Koei Co.,LTD.

http://www.n-koei.co.jp

Placing More Emphasis on Long Span Bridges and Urban Viaducts that Require Advanced Technology

-3-D Dynamic Nonlinear Analysis Tools are Effectively Used; 3-D VR Attracts Attention for its Potenti

- The Present Conditions of Overseas Business Including Bridges
- "UC-win/FRAME (3D)" is Effective in FS of the Padma Bridge
- Starting to Use "UC-win/Road" at the Opportunity of the Tanjungpriok Port Project
- Managing Overseas Projects with Wiki

NEWJEC Inc.

http://www.newjec.co.jp

NEWJEC utilizes 3D dynamic nonlinear analysis tool as well as technology of in-house development such as traffic simulation and VR.

- Roads & Transport Group covers areas of rraffic planning, highways, and bridges
- From Design Software for Bridges to "UC-win/FRAME(3D)"
- Focus on the evolution of traffic simulation and VR by using self-developing technology.
- Future development and visualisation.

Nishitetsu C.E.Consultant Co., Ltd.

http://www.ncec.co.jp

NCEC Expects 3-D Real-time VR as a Key to Expansion

- The First Design Dept. to Take Charge of Roads
- Computer Committee Takes Leadership in Incorporating IT in the Whole Company
- The First Project Using Forum8 UC-win/Road Plans In Other Projects
- Plans In Other Projects
- Future Business Environment and Positioning of UC-win/Road

Consultant

Taisei Engineering Co., Ltd.

http://www.taiseieng.co.jp

Cooperating with In-house Divisions, They Are Committed to Services through Applications of 3D VR

- Dealing with Emerging Needs Based on Advanced Technologies
- Challenges in the Existing Tasks and Concretizing Use of 3D VR
- Aiming at More Advanced Applications by Introducing SDK
- Future Expansion and Expectation

Docon Co., Ltd

http://www.docon.co.jp

Docon Co., Ltd has worked as the biggest foundation consultant in Hokkaido since 1960.
Their business area is not only Hokkaido but also Kanto area, Touhoku area and so on with various fields.

JR-Central Consultants

http://www.jrcc.co.jp

JR-Central Consultants was established as only family company of Central Japan Railway Company on October, 1997. They deal the project about railway, survey for various industries, planning, design for civil engineering and architecture.

Yachiyo Engineering Co.,Ltd

http://www.yachiyo-eng.co.jp

Their concept is "Provide good service to their customer and public as high technical group". They have been expanded their business since 1963. Now they work not only in Japan but also overseas as the top 5 high technical group of Japan.

Overseas

University of Greenwich

How should we develop the latest perception provided from tsunami and evacuation analysis into current tsunami prevention

- Evacuation analysis in a urban area and larger region
- Evacuation analysis linked with internet
- Research about the behavior of people evacuating in the past flood disaster
- A lot of applied visualization cases
- Evacuation training a lot of people can take part in on cloud

National Housing Authority: NHA

http://www.nha.co.th/

UC-win/Road is a useful tool for housing development which can visualize the design in way cheap, fast and user-friendly.

- National Housing Authority: NHA positively using BIM and VR.
- They used UC-win/Road in the predictive simulation in a traffic jam.
- Software training center has been completed for designers.
- Driving Simulator has been introduced.

TECCO2

http://tecco2.com.vn/

UC-win/Road has become an essential tool for civil design proposals in Vietnam where infrastructure construction projects are in bloom

- Immediate decision of adopting UC-win/Road in 2007
- Friendly-use of UC-win/Road and its indispensability for civil design proposals
- Traffic conditions in Vietnam reflected in the work
- Expanding the use of UC-win/Road by linking with their in-house developed software

Swee Hong Engineering & Construction Pte Ltd.

http://www.sweehong.sg/

Introduced Allplan and UC-win/Road into civil engineering field in a short term
Construction company who expands BIM at warp speed in Singapore.

- Using Allplan for creating BIM model and having a presentation via UC-win/Road.
- BIM is a developing solution even in Singapore.
- A realistic presentation about the construction sites can be done by importing BIM model into UC-win/Road.
- BIM was used for "Garden by the bay" which is a new sight in Singapore.

BMIA

http://www.bmia.fr/

Tunnel manager who needs to make an appropriate judgment when the accident occurs The accident and fire are visualized by UC-win/Road for the training

- Realistic representation by simulator "UC-win/Road" for the accident training
- Behavior of trainee is registered to output the evaluation report
- High-evaluation for the software development kit for the linkage of UCwin/Road with the original system
- Expectation of the world first system, practical use for a wide range of issues such as traffic congestion

Robert Gordon University

http://www.rgu.ac.uk/

Simulation of traffic cycle in the large-scaled road construction project with the visualization of UC-win/Road

- New university established 20 years ago, high-evaluation for the developmental effort
- Utilization of UC-win/Road for simulation of traffic congestion prediction

Sunderland University/AMAP

http://centres.sunderland.ac.uk/amap/

Focused on the research of electronic vehicles and low carbon vehicles Utilization of driving simulation with UC-win/Road

- Research base of carbon vehicles
- Utilization of eco-drive plug-in
- Comparison test using simulator

Omnitrans International BV

http://www.omnitrans-international.com/

From evacuation modeling, land-use, to traffic inter action Improved function with the linkage of UC-win/Road

- Support for a variety of project based on traffic planning and modeling
- Linkage with FORUM8

Shanghai Municipal & Traffic Design Institute

http://www.smtdi.com

UC-win/Road for the improvement of intersection and the maintenance of subway in Shanghai

- City development in China with eco-friendly sensitivity
- Construction consultant in Shanghai adopted UC-win/ Road
- Strong presentation feature in bidding
- Solution for the complex structures with "Front-loading"
- Mr. Rongze who involved in F1 circuit project in Shanghai
- Support service for Chinese users by local staff

Ourston Roundabout Engineering, Inc.

http://www.ourston.com/

North America's Leading Roundabout Design Team, Ourston has made efforts in Illustrating and Spreading Them
– Explaining Mechanisms and Advantages of Roundabout Intersections as an Effective Solution, by Modeling them Using VR

- Adoption of Roundabouts and Their Problems in the U.S.A.
- Background of Adopting UC-win/Road and the Evaluation through Using It
- Future Expectations

Thiess Pty Ltd

http://www.sucdri.com

The Survey and Technology Applications group
A Group in the Largest Construction Company in Australia with a 75-Year History, Supporting Various Corporate Projects
– Making Effective Use of Innovative Spatial Technologies Including 3D/4D Modeling, It Aims to Achieve Advanced Communication and Presentation

- Story Behind its 75th Anniversary
- As Support Tasks Become Advanced, New Tools Receive Attention
- Expanding Application of UC-win/Road to Existing and New Projects

SHANGHAI URBAN CONSTRUCTION DESIGN &RESEARCH INSTITUTE

http://www.sucdri.com/

Driving and construction simulation of the city planning business, north and south road, for Shanghai Expo in 2010
– Demonstration and the effect of VR expression in a short term –

- The 3D (VR) technology produced self-developed technology effetely.
- Various effects to aesthetic design
- Effects of using UC-win/Road

Korea Institute of Construction Technology

http://www.kict.re.kr

KICT is the public institute which research not only road and bridge but also all field of construction technology. It was established in 1983. Now there are 700 researchers at this institute.

Korean Agricultural & rural Infrastructure

http://www.karico.co.kr

KARICO is the big group which has relation with government. There are 900 staff at head office and other 6000 staffs in 9 brunch office. 60 staffs deal information controlling and they have various projects.

UC-win/Road Drive Simulator: Introducing Users

Abstract of User Introduction from Up&Coming

Aisin Seiki Co., Ltd. (AISIN) NEW

ITS Simulator
http://www.aisin.co.jp/

The 2nd ITS Group, The 1st Electronic Engineering Dept.

AISIN Proposes Solutions for Realizing Sustainable Community That Are Safe and Enjoyable. Simulator to Offer Near-Future ITS Experience Built up with UC-win/Road

■Expanding Global Network and Business Fields
AISIN will reach its 50th Anniversary Next Year
■UC-win/Road Introduced in DS for "ITS World Congress Busan 2010"
■DS Design Renewed in "ITS World Congress Tokyo 2013"
Functions Upgraded to Get Real Feeling of "Contact Between People and Automobile in the Near Future"
■Needs for DS and its Future Possibilities of Use

▲Mr. Niwa, Team Leader, the 2nd ITS Group, the 1st Electronic Engineering Dept.

▲ITS World Congress 2013 (AISIN booth)

▲ITS simulator
(AISIN original design)

FLOVEL CO., LTD. NEW

Bicycle Simulator
http://www.flovel.co.jp/

Application System Development Group

Experienced in Developing Applications Using Advanced Video and Image-related Technologies. FLOVEL Adopted UC-win/Road to Reinforce Functions of Virtual Cycling System

■Enhancing from Video and Image Equipment for Measurement to Diverse Application Systems
■Shots of the Space and Deep-sea with Ultra High-sensitive Cameras Creating a Sensation on TV Also Putting Efforts into Development of Radioactive Substance Visualization and Biotechnological Products
■Towards Development of New Version of the Virtual Cycling System Improved a Sense of Reality Using UC-win/Road
■Advantages of Introducing UC-win/Road and Future Expansion

▲Staff of Application System Development Group at the Showroom

Toyota Motor Corporation

A simulator with infrastructure cooperative systems
http://www.toyota.co.jp/jp/tech/its/

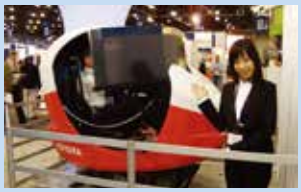
Strategy Planning Dept., IT & ITS Planning Div.

TS Vision Painted by an Automobile Manufacturer Towards Actualization of a Sustainable Mobility Society

—Approach with Autonomous and Vehicle-Infrastructure Cooperative Systems. Taking a Concrete Form With Focus on DS of 3D VR as a Prerelease Trial Tool of Services—

■Current of ITS Promotion and Efforts of TOYOTA
■3D VR Trial Simulator Installed at The 15th World Congress on ITS (NY)

▲Mr. Yasumasa Masujima, Assistant Manager of Strategy Planning Dept., IT & ITS Planning Div., and Mr. Koji Sonoda, Project Manager of the same Dept.



▼Safety driving supported system simulator with infrastructure cooperative system (UC-win/Road Drive Simulator)

Vehicle Information and Communication System Center (VICS Center)

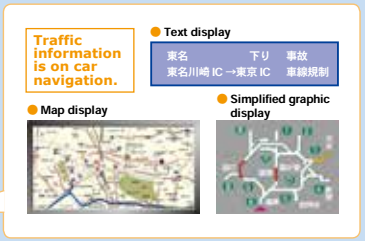
VICS Drive・Simulator
http://www.vics.or.jp/

VICS - Supports Safe and Comfortable Driving Through Vehicle Information Realizes VICS-DS for a New Service Based on UC-win/Road-DS

■Progress for 16 Years and Current System
■Outline and new services of VICS
■Development Stream of VICS-DS

▲People of Vehicle Information and Communication System Center

▲VICS Drive Simulator



▲Traffic information flow in the VICS system

Alpine Electronics, Inc.

http://www.alpine.com

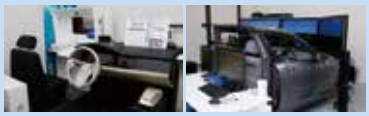
HMI Advanced Development Team, Advanced Development Dept.

Using Biological Signals for Developing In-vehicle Devices to Consider Driver Distractions. Constructing a Unique Evaluation System on the Basis of UC-win/Road DS

■Responding to the Needs of the Next Generation with a Wide Range of In-car Devices
■New Research System Focuses on HMI of In-car Devices
■Concept of DD Evaluation and System Development
■Use and Potentiality of the Evaluation System

▲ Alpine Electronics, Inc., Advanced Development Dept., HMI Advanced Development Team members

▲Mr. Ohnishi Yoshinari, senior engineer, Advanced Development Dept., Alpine Electronics, Inc.



Highway Industry Development Organization

Smartway2007
http://www.hido.or.jp/

ITS Research & Management Division,
Project PromotionsDepartment,

"Smartway" to Direct the Course of Next-generation ITS Society

—Fresh Potential of 3D VR and DS Shown in the Experience Demo of New Services—

■Investigating Development and Practical Application of State-of-the Art Technologies Related with National Road Policy
■Progress on ITS and Position of Smartway
■Outline of "Smartway 2007 Demo"
■Towards ITS deployment in the future

▲(From the left) Mr. Osamu Iwami, Senior Assistant Manager, ITS Research & Management Division; Mr. Kenji Takahashi,Project Promotions Department; Mr. Takashi Urano, Deputy Director, Planning & Development Department and ITS Research & Management Division; Mr. Kazunori Iwasaki, Then Senior Assistant Manager, Project Promotions Department

Meijo University

Driving ability checking system
http://www-is.meijo-u.ac.jp/

Dept. of Information Engineering, Faculty of Science and Technology

Based on the Keyword of "Only One" and "Serve the Society" rather than studying for study,

—They Aim for Developing a Driving Ability Judgment System for Aging Society—

- ■Dept. of Information Engineering Leading ITS Researches in Various Fields
- ■ITS Approaches from "Image Information Processing" and "Human Interface"
- ■Circumstances of Introducing "UC-win/Road" and Future Expansion

▲(Left) Professor Shin Yamamoto from his Laboratory, (Right) Prof. Tomoaki Nakano from his Laboratory

◀ Meijo University Driving Simulation

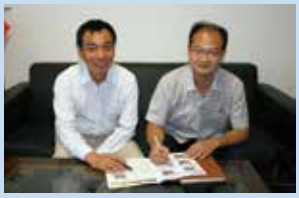
Tianjin University

Website of Tianjin University
http://www.tju.edu.cn/

School of Management

Analysis of drivers' behavior by using Driving Simulator.Request to use UC-win/Road due to China's unique transportation practices.

- ■ Visit to a FORUM8 customer in China
- ■ UC-win/Road and Driving simulator are actively used at Tianjin University
- ■Studying transportation behavior in Tianjin where infrastructure are being constructed
- ■ Optimizing UC-win/Road to a new research tool for analysis
- ■ They have chosen UC-win/Road because of its graphic quality and easy-to-use features
- ■ What is necessary for the simulation of the Chinese transportation environment



▲Professor Mah and Doctor John

Driving simulator placed in the laboratory ▶

Kyoto University Graduate School

http://www.um.t.kyoto-u.ac.jp/ja

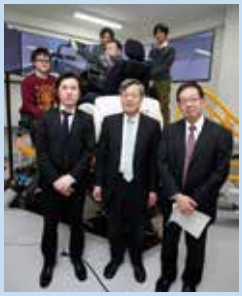
Logistics Management Systems Laboratory / Intelligent Transport Systems Laboratory, Department of Urban Management

Towards Establishing Sustainable, Safe and Comfortable Transport System with International Competitiveness

Realizing Advanced Driving Simulation Experiment by Connecting Various Kinds of Functions to DS for High-level Studies

- ■Changes in Department of Urban Management and Its System
- ■Logistics Management Systems Laboratory Studying Urban Logistics Systems with Unit for Liveable Cities
- ■Intelligent Transport Systems Laboratory ICT is Essential for Smarter Use of Transport System
- ■Limits of Experiments in a Real Car and Needs for DS
- ■Actions of the Laboratories After Adopting DS

▲Joint study with Hanshin Expressway



▲Members of the Logistics Management Systems Laboratory and Intelligent Transport Systems Laboratory

National Agency for Automotive Safety & Victims' Aid

Internet congruity checking system "NASVA Net" CG
http://www.nasva.go.jp/

Safety Guidance Department

To Aim at Contributing to Realizing Secure and Safe Society Through Automobile Accident Prevention and Support to Victims

—"NASVA Net", Internet Aptitude Diagnostic System Using 3D VR-based Driving Simulation Diagnosis as Its Core, Has Started Its Service—

- ■"Preventing, Supporting, and Protecting" as the Mainstay of the Services of NASVA
- ■The Existing Constraints and the New System Development of VR Application in an Aptitude Diagnostic System
- ■The Overview of "NASVA Net"
- ■Future Development and Response to Safety Management

▲(from the left) Mr. Tomoyuki Fuse, Chief of Safety Guidance Department; Mr. Takahisa Karasudani, Director of NASVA; Mr. Mitsuru Nishio, Manager of Safety Guidance Department

East Nippon Expressway Co., Ltd.

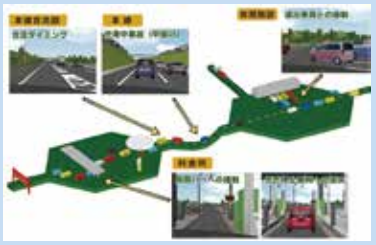
http://www.e-nexco.co.jp/

ETC Management Division,Operation Div.,

Covering from the Spread of ETC to Traffic Safety Measures: Using the Highway Driving Simulator as an Approach to Improving Safety

- ■ Positioning and Activities of ETC Management Division
- ■ Developing DS Based on UC-win/Road to Enlighten Traffic Safety
- ■ Expectation towards Expanding Possibility of Utilization

▲Mr. Akira Mitsuishi, Assistant Manager, ETC Management Div.



▲Highway Driving Simulator (left) / Representing 19 potential dangerous events on expressways (right)

National Housing Authority: NHA

http://www.nha.co.th/

UC-win/Road is a useful tool for housing development which can visualize the design in way of cheap, fast and user-friendly.

- ■National Housing Authority: NHA positively using BIM and VR.
- ■Starting with visualizing the existing project
- ■Software training center has been completed for designers.
- ■Driving Simulator has been introduced.

▲Driving simulator set on the corner of a lecture center

AMLUX Toyota Co., Ltd

TOYOTA AUTO SALON AMLUX TOKYO, Showroom
http://www.amlux.jp/

TOYOTA AUTO SALON AMLUX TOKYO

■Installation of ITS Driving Simulator ※ITS=Intelligent Transport System

▲ITS Driving Simulator

※The contents and images on this page are posted with permission of AMLUX TOYOTA Co., Ltd.

Information of permanent exhibit of UC-win/Road

•Construction technology pavilion (Kensetsu Omoshiro Techno Kan)

▲Model of virtual city at the site.

▲UC-win/Road Drive Simulator

•Advance technology pavilion @ TEPIA

▲Drive simulator selected for advanced technology exhibition 2 years in a row

▲New service of SMARTWAY can be experienced

User Introduction Movie is now showing

From Up&Coming No. 89, the movie showing of the users are introduced on out company's HP and YouTube as well. Please access them. On YouTube channel of Forum8, a lot of movies such as introduction of works in 3D and VR contest besides introduction of UC-win/Road's users are introduced. Please browse them. ·····> **http://www.youtube.com/user/F8OSAKA**

User introduction 104th NEW

Kobe Enterprise Promotion Bureau

Kobe City Government

The interview with Mr. Matsuzaki and Mr. Kamiki of Kobe Enterprise Promotion Bureau and their approaches for spreading simulation using supercomputer and industrial promotion, inviting the enterprises etc. can be seen.

http://www.youtube.com/watch?v=vUbK1rB6g5I

User introduction 103th NEW

FLOVEL CO., LTD.

Application System Development Group

You can see the interview with Mr. Gushiken of FLOVEL CO., LTD. and the introduction about video and optical equipment via the latest technology and virtual cycling system via UC-win/Road.

http://www.youtube.com/watch?v=jXmZ0zjKduM

User introduction 97th

【Introduction of Users in Okinawa ①】

University of the Ryukyus

The tsunami analysis software of Prof. Nakaza of faculty of engineering, University of the Ryukyus and advanced analysis using the mini-supercomputer can be seen.

http://www.youtube.com/watch?v=vFacXGAuYWA

User introduction 97th

【Introduction of Users in Okinawa ②】

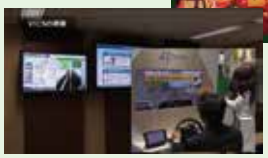
Okinawa Structural Design, Inc.

The interview with Mr. Reiji Iha, CEO of Okinawa Structural Design, Inc. and Mr. Sueo Okajima, Director of the Designing Division and the future of the landscape simulation via UC-win/Road can be seen.

http://www.youtube.com/watch?v=2LVLr38GZV4

User introduction 95th

Vehicle Information and Communication System Center (VICS Center)



You can see the system of VICS(VehicleInformation and CommunicationSystem) which supports safe and comfortable driving via road traffic information and the state of exhibition in ITS Orland and Tokyo Motor Show 2011. **http://www.forum8.co.jp/user/UC95-user-VICS.html**

User introduction 94th

Iiyama-city Nagano Water pipe construction department

The interview with Mr Takashi Matsuzawa (the maintenance manager surrounding the station of express of Iiyama-city Nagano Water pipe construction department) and the state of scenery in review by UC-win/Road can be seen. **http://www.youtube.com/watch?v=ftRYZkcMZMg**

User introduction 92th

【Introduction of Users in Tohoku ①】

Koriyama survey design Co., Ltd

You can see the state of an approach for earthquake disaster reconstruction in the interview with Mr. Kazuya Wanatabe (CEO of Koriyama survey design Co., Ltd) and Mr. Haruhiko Sato (Design Manager of the same company).

http://www.youtube.com/watch?v=wWSBDSvoYPA

User introduction 92th

【Introduction of Users in Tohoku ④】

Kikuchi-Giken Consultant Co., Ltd

The interview with Mr. Tsuyoshi Kikuchi (CEO and technical director of Kikuchi-Giken Consultant Co., Ltd) and the approach for earthquake disaster reconstruction can be seen.

http://www.youtube.com/watch?v=gVH1z6dIQvs

User introduction 91th

Tokushima University

Graduate school Technology and Socio-Science Research Development Engineering Department Urban design laboratory

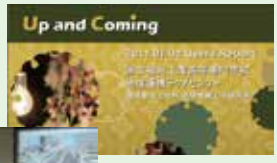
You can see the state of the interview to Professor, Hideo Yamanaka, of Socio-Technology and Science Research Laboratory in Tokushima Graduate school and bicycle simulator is actually used etc.

http://www.youtube.com/watch?v=3SrzOQTfKc4

User introduction 89th

Fukui National College of Technology

Regional alliances Technology Center environmental and urban engineering epartment Spatial Information Engineering Laboratory



The interview to Associate Professor ,Kazuhiko Tsujino, of environmental and urban engineering departments in Fukui National College of Technology and the condition of VR lecture, comment of fifth grade students of environmental urban engineering can be seen. **http://www.youtube.com/watch?v=svJNe8N1wac**

3D • VR Simulation Service

FORUM8 DS Solution

UC-win/Road Driving Simulator configuration example

UC-win/Road Driving Simulator lineup

8DOF Traffic Safety Simulator (P.49)

<Software> • UC-win/Road Driving Sim
• Motion platform option
• Cluster option • Cluster client x9

<Hardware>
• Order made dome type cabin (Real car cutaway body used)
• All surroundings dome projection projector
• 6 axis motion, payload 4,000kg, maximum acceleration 0.5G

Human - Vehicle - Traffic Flow Interoperable Driving Simulation System for Interactive Information Exchange (P.53)

<Software> • UC-win/Road Driving Sim
• Motion platform option
• Cluster option • Cluster client x8

<Hardware> • 1 person cabin (real car parts used)
• 5 sheets of 60 inches LCD monitor
• 6 axis motion, payload 650kg, maximum acceleration 0.7G
• HILS/ECU emulator • Eye mark recorder

UC-win/Road Experience Simulator (P.43)

<Software> • UC-win/Road Driving Sim
• Motion platform option

<Hardware>
• 6 axis motion, payload 350kg, maximum acceleration 0.5G

Highway Driving Simulator (P.44)

UC-win/Road Driving Simulator (P.42)

<Software> • UC-win/Road Driving Sim
<Hardware> • 42 inches or 32 inches LCD monitor 3Ch
• Parts / instrument panel, real car parts used
• Active steering option (separate option)
• Motion platform option (separate option)

Safe Driving Simulator (P.45)

UC-win/Road Simple Simulator

<Software> • UC-win/Road Driving Sim
<Hardware> • 3 sheets of 42 inches LCD monitor
• Controller for game, seat for game

Driving Simulator for seniors (P.47)

UC-win/Road Demo Simulator

<Software> • UC-win/Road Driving Sim
<Hardware> • 20 inches LCD monitor
• Simple steering, accelerator pedal, brake pedal

Ship Handling Simulator (P.58)

UC-win/Road Simple Driving Simulator for seniors (P.47)

<Software>
• UC-win/Road Driving Sim

<Hardware>
• 21.5 inches LCD monitor
• Real car size simple steering
• Accelerator pedal, brake pedal

Train Simulator (P.55)

<Software>
• UC-win/Road Driving Sim

<Hardware>
• 50 inches LCD monitor (front)
• 42 inches LCD monitor (side)
• Real car master controller, brake controller
• Various meters

cycleStreet City Edition (P.57)

<Software>
• UC-win/Road Driving Sim

<Hardware>
• 3 sheets of 21.5 inches LCD monitor
• Aero bike

UC-win/Road Driving Simulator

International version
Japanese/English/Chinese/Korean/French

Four wheel in-vehicle simulator

It allows you to create several driving situations and re-create it under complete control. Recently Drive Simulator is widely used for vehicle system development or interaction research among drivers, vehicles, road and traffic, on ITS traffic system research.

The features of UC-win/Road Drive Simulator

- Driving environment in 3D environment can be freely created via UC-win/Road.
- Standard plug-in included
- Standard VR data is free and scenario customization is supported.
- Various environments can be reproduced via visual option tools.
- Reasonable pricing mass OEM production
- Supports high simulation needs by customization

Applications of Drive Simulators

1.Proposal of Drive Simulator
Research institute → University, Research & Development institute, Association
Road design → Road company, Consultant, Building firm
Exhibition & Publicity → Pavilion for publicity, Events, Road facilities
Road safety → Police, Driving school, Various associations, Non-life insurance company

2.Producing VR data service・Scenario service
Creation of VR data in a real and virtual environment, amusement, and games.

3.UC-win/Road customization・SDK
Wide range of customization. It supports users flexible utilization and redistribute the system SDK (Development kit)

4.Providing large dimensional and high quality 3D space.
Railway simulation / high accuracy headlights / support for environment lighting

Driving Ability Judgement System Dept. of Information Engineering, Faculty of Scienceand Technology, Meijo University →P47

Drive Simulator system component

UC-win/Road Drive Simulation Option + Car dynamics model/ acoustic engine

<Option>
■Navigation type of monitor ■Clutch & manual gears changes
■Left handle ■UC-win/Road SDK development kit ■PC
※Separate software customisation is required.

●UC-win/Road Simple Simulator

ECO Driving plug-in can be used. This allows you to calculate the fuel consumption and carbon footprint of individual vehicles while driving through a 3DVR model and support the function to edit a graph.
Basic configuration : 3 of 17" LCD monitors / 1 of PC (3 screens supported) Steering controller for game / Seat for game

Price for Drive Simulator (Packaging system)

Specifications	Order number	
	1	Multiple-units
UC-win/Road Drive Simulator Basic configuration ※1	US$ 40,000	open price
UC-win/Road Driving Sim	US$12,800	open price
Total	**US$52,800**	**open price**
Item	**1**	**Multiple-units**
Active Steering Wheel	US$ 11,500	open price
Navigator type Monitor	US$400	open price
2DOF Motion Platform (500kg)Packed	US$ 33,000～	open price
3DOF Motion Platform (500kg)Packed	US$ 40,000～	open price
Left-hand drive, Clutch pedal (each software)	US$ 1,000	open price

The extra cost for package・shipping・carrying required/Free 1year support. not including PC

Optional products (price)

Cluster	(US$8,600)	Motion platform	(US$3,360)
Cluster client	(US$660)	SDK(A development kit)	(US$3,360)

Specifications	Rental terms		
	1day	1month	1 year
UC-win/Road Drive Simulator Basic configuration ※1	Basic fee US$2,500	Basic fee US$10,000	Basic fee US$23,000
UC-win/Road + Drive option	Additional fee(for 1day) US$1,000	Additional fee(for 1month) US$4,000	Additional fee(for 1year) US$15,000

Setting and Shipping fees
Free before and after 1 day of the shipping date or transferring date. Rental fees are charged before and after 2 or more days. Actual expenses for packing, transferring, and carrying in Setting fee: US$500 (Free dispatching one engineer, but actual expenses for accommodation and travelling)

※1 1/4 Cabin, Full Instrumentation、3ch. 42" LCD monitor、5.1ch Speaker, Body Sound、CFLS Controller
※2 Price of Demo Simulator unit: US$14,000/UC-win/Road Advanced: US$9,000

UC-win/Road SensoDrive Simulator

Driving simulator supporting UC-win/Road force feedback

SENSO-Wheel (steering controller) allows to link with dynamics of UC-win/Road, which enables to experience the steering operation that is similar to the one of actual vehicle in 3DVR environment.

●Main features
1) Force Feedback
Obtaining the steering position from steering controller and sending the simulation results to steering controller enables the driver
2) Various parameter settings
Setting friction force, damping force and spring stiffness
3) Calibration function
Center position and maximum rotating angle of steering can be freely assigned.

●Purposes to use
■Training for drivers
■Verification for road repair
■Simulation on a rough road like mountain or road that has a lot of curves like slap

●What is SENSO-Wheel
Steering controller equipping with force feedback function that SENSODRAVE GmbH produces. Driving motor equipped on a steering enables you to obtain the behavior that is closer to reality.

Developer of SENSO-Wheel:
SENSODRIVE GmbH (Germany)

Argelsrieder Feld 20 TE04
D-82234 Weßling
Phone : +49 (0) 8153-28-3900
E-mail : norbert.sporer@sensodrive.de
Web : http://www.sensodrive.de/

UC-win/Road Experience Simulator

6 axis motion units/Subaru Driving Simulator

The use of actual car steering mechanism gives you a sense of realism while driving. UC-win/Road Experience Simulator allows you to simulate driving environments in accordance with the rapidly improved car safety technology of ITS technologies (crash avoidance, decreased impact).

Features of UC-win/Road Experience Simulator

1) Possible to apply VR space freely and give various driving environments in real-time

・You can easily create 3D VR space. 3D cockpit, manual driving mode, and multi-monitor set-ups can be enabled in the simulator. In addition, it allows you to setup various events and scenarios.

・You can customize the setup of driving environments under the visual options.

2) Possible to implement various safety devices and give customization of the simulator (standard package /option package are now available and customized package will be available in the near future.)

1. ABS(Anti-lock Brake System) / 2. 4WD / 3. VSC (Vehicle Stability Control)
4. Pre-crash safety system / 5. LKA (Lane Keep Assist)
6. VDIM (Vehicle Dynamics Integrated Management)
7. Adaptive cruise control

The functions above can be enabled by customizing the basic library. Customization will be provided through Made To Order (MTO) development.

3) Standard VR data corresponding customization of scenario, events, and higher Hz are free]

You can download the sample models of UC-win/Road Viewer including roads, traffic, and cities. Also, you can manipulate signal controls and set up road obstacles, so you can create various interactive scenarios.Customized data pertaining to collision validation and accident scenarios can be created via our cost estimation service. (Please see the examples)

4) Compact body design

・Streamlined Eggshell design : the body is round due to safety considerations.
・Low floor
・Improved entrance platform : Small 6 axis motion unit, together with the low-floor design, increases the degree of control on motion height.
・Space Optimization : Single seater setting and the location optimization of the instrument panel provides a comfortable maneuvering environment
・Dedicated 1 screen LCD monitor and steering mechanism are results of space optimization
・It was achieved by space optimization of steering feature

5) Realistic Maneuver

・The actual car steering mechanism by Subaru automobile provides an optimized reaction force feedback and excellent handling while driving.
・Actual pedal mechanism facilitates the ease of maneuver.

6) Easy setup and mobility

・Minimum installation space. The surface area of the standard simulator is 2040m x 1330m.
・Easy movement using the attached wheels and jack installation. Electric power supply is 100V and is only suited for single phase.

7) Standard equipment of each safety device

・Three detachable seatbelts、・Driver are prohibited from driving without putting on seatbeats.
・Safety prevention functions include emergency stopping by pressing the emergency button and bringing the vehicle to a temporary stop.

6 electric axis motion unit

Motion performance	Movable axis	Movable scope	Peak acceleration	最大速度
	Back and forth (X-axis)	±96mm	0.5G	225mm/sec
	Right and left (Y-axis)	±86mm	0.5G	225mm/sec
	Up-and-down (Z-axis)	±67mm	0.5G	225mm/sec
	Roll (X-axis roll)	±15dg		
	Pitch (Y-axis roll)	±15dg		
	Yaw (Z-axis roll)	±15dg		
Pay load	Under500kgf	Power source	AC200V 50/60Hz single phase 4KVA	
Host interface	RS-232C D-SUB9 pin			

System Price List

Product Name	Price
UC-win/Road Driving Sim	US$12,800
Motion platform option	US$8,000
Total price	**US$20,800**

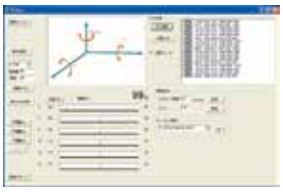
＊Customization of safety device is available in a separate estimate.
＊Standard data models are attached(see reverse). New creation US $1,000 / 1km
＊Installation fees for the PCs and the simulators and the shipping costs are not included.
＊The prices don't include tax.

Infrastructure Cooperative simulator
Toyota Motor Corporation →P38

Link with CarSim

By driving in the UC-win/Road Experience Simulator, the dynamic behaviour of various passenger vehicle driving parameters (accelerator, brake and steering wheel operation) can be analysed under a range of environment conditions (changes in the level of the road surface, friction coefficient, cross wind, etc.), real movement can be provided through motion and VR driving simulation can be carried out on UC-win/Road.

▲CarSim by Virtual Mechanics Corporation



▲Basic control system for motion

Repro of a road condition/customization

Simulate a highly precise road material and the road surface type of a road condition. According to a state of the weather, the road surface friction coefficient mu can be set and it can be correctly reflected in the action of a simulator, and the action of a motion.

About display performance

★Keep frame rate to prevent simulation sick

A FPS (frame per second) measuring result by 3ch, 42' monitor

1. Cross-point + landscape + traffic flow Frame rate 125.7 FPS

2. Cross-point + landscape (high accuracy) + traffic flow video board setting = 3 screen vertical synchronization Frame rate 60.3 FPS *Refresh frequency in screen will be peak

Simulator product lineups

PC and software are also available (UC-win/Road Driving Sim US$12,000)
MPF option (US$ 8,000)

Product Type	Main body Price	Product Description
 Compact Research Simulator (2010)	US$52,800 (3ch standard)	・Research simulator (UC-win/Road/DSop. included) ・Full usages of actual car components ・Supports both Left/Right driving operations & both automatic and manual transmission ・Passive steering wheel (standard) / Passive steering wheel (optional. US$13,500),MP (1-6 axes, optional)
 Driving Simulator (2013)	Estimated price US$241,400 (3ch standard)	・cabin ・32" LCD monitor ・6-axix motion platform(500kg) ・5.1ch Speaker, Body Sound ・Force feed-back steering system ・Accelerator/brake pedal system ・Direction indecator, mission option ・UC-win/Road Driving Sim ・Motion platform option
 Demo Simulator (2007)	US$10,000 (1ch standard)	・Simplified simulator (UC-win/Road not included) ・Compact type for exhibition/demonstration, Start/Stop button ・Handle, accelerator, brake installed

＊PC sold separately / hardware warranty is issued by the manufacturer

UC-win/Road Highway Driving Simulator

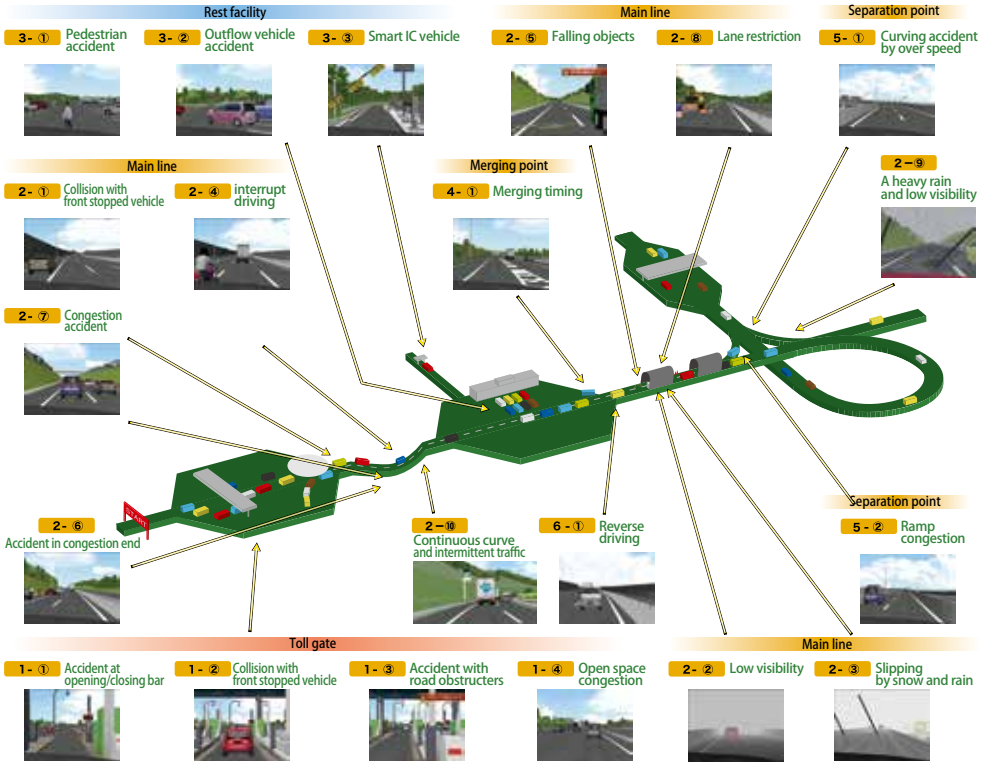
Potential hazards on highway can be replayed by the driving simulator

Based on Subaru automobile's technologies,the simulator body adopted 6 electric axis motion unit (patented) and automobile technologies from Subaru automobile. The use of actual car steering mechanism gives you a sense of realism whilst driving. UCwin/Road Experience Simulator allows you to simulate driving environments in accordance with the rapidly improved car safety technology of ITS technologies (crash avoidance, decreased impact).

FORUM8 won an award for "Information processing systems for their contribution to today's information-rich society"

2011 given by the monthly council for information promotion (October 3, 2011).

Experiencing 19 hazardous events on highways and its facilities



Events set for the experience driving

Events set for people of all ages to experience driving. Events hosted by NEXCO set for people of all ages to experience driving are taking place at given service areas and other venues throughout Japan on given weekends. At each event, many visitors line up to get on the driving simulator to experience all types of dangerous situations that they may come across had they got in the real car to drive through a real highway. At the end of the drive they are assessed for correct driving skill, the part they also love.

Menu configuration

6 DOF based experience simulator SUBARU type

SUBARU Driving Simulator

■FORUM 8 has installed custom Highway Driving Simulator to Convention on Social Contribution of Highway on March 1st, 2010.
From now the simulator will be used at events and exhibitions on highway and its facility.

Overview of driving simulator

The control part and 3D movie of this simulator system is developed by FORUM8 product, UC-win/Road by improving the required system control and customization techniques based on our VR software technique. This system is widely used to experience a variety simulation for ITS technologies (autonomous, infrastructure cooperative safe driving support system), driving scenes, research.

Main Body Specifications

Capacity	Capacity 1 Person	
Seat	Passenger seat	
Vehicle weigh	830kgf	
Power Supply	AC100V 50/60Hz Single phase 1.5KVA	
Main control device	PC supported Windows OS : WindowsXP	
Image display device	26inch WXGA Color TFT-LCD Module 1366x768pixels x 3	
Sound device	4.1ch system	
Steering device	Force feed-back steering system and Accelerator/brake pedal system	
Package	External panels (Front/Back)	Urethane molded part
	External panels (side)	GFRP molded part
	Inner panels	ABS mold goods
	Frame	Steel sheet frame
Rack	Steel base	
Setting method	Moving with detachable casters	

Electric 6-axis Motion Data

Motion performance	movable-axis	Movable scope	Maximum acceleratin
	Front/back(X-axis)	±120mm	0.4G
	Left/right(Y-axis)	±135mm	0.4G
	Up/down(Z-axis)	60mm(P-P)	0.1G
	Roll(X-axis turning)	±0.192rad ±11deg	–
	Pitch(Y-axis turning)	±0.192rad ±10deg	–
	Yaw(Z-axis turning)	±0.192rad ±17deg	–
Payload	Under 350kgf		
Power Supply	AC100V 50/60Hz Single phase 1.5KVA		
Host interface	RS-232C D-SUB9 pin		

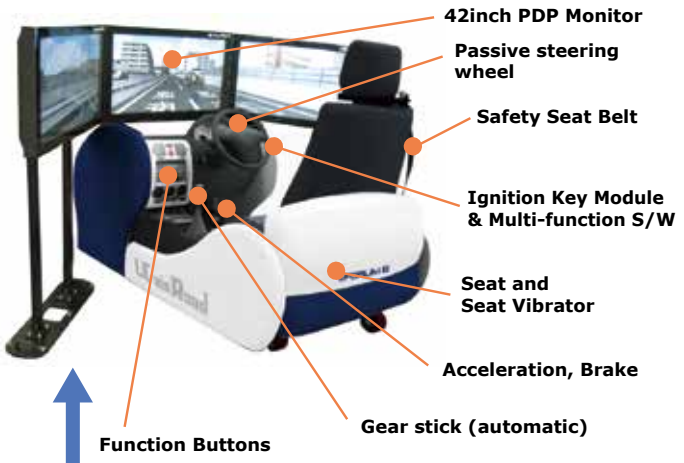
UC-win/Road Safe Driving Simulator

UC-win/Road Drive Simulator Lineup

Simulator basic system price US$52,800～

Driving Simulator for driving schools that complies with the certification standards for simulators (awaiting certification)

Driving Simulator System Configuration



UC-win/Road Drive Simulation Option + Car dynamics model/ acoustic engine

<Option>

■Navigation type of monitor ■Clutch & manual gears changes
■Left handle ■UC-win/Road SDK development kit ■PC

Separate software customisation is required.

UC-win/Road Drive Simulator (Packaging system)(Before tax)

Product	Order quantity		
	1	10	20
UC-win/Road Drive Simulator main body	US$40,000	US$38,000	US$36,000
UC-win/Road software +Drive option	US$12,800	US$10,800	US$8,800
Total	**US$52,800**	**US$48,800**	**US$44,800**

*A packing and shipping cost, PC are not included (FOB : Tokyo, Japan)

■Option product(Price) *Eye mark recorder supported.

Motion platform	(US$8,600)	Micro Simulation Player	(US$3,360)
ECO drive	(US$3,360)	SDK (Sytem development kit)	(US$3,360)

Safe Driving for Educational Material

1. Based on the certification standards for driving simulators
1) Lesson on hazard perception (5.5 km road with 13 hazards)
2) Lesson on night-time driving (5.5 km city road with 9 hazards)
3) Lesson on sudden braking (Braking distance on dry surface, wet surface and frozen surface)
4) Lesson on driving on the highway (over 15 km highway or freeway with 8 hazards)
5) Lesson on location-specific conditions (over 8 km with specific location-specific conditions including climate and geographical features.)
6) Lesson on driving in bad condition (over 5 km road featuring 5 sections with bad driving conditions.

2. Optional scenarios
7) Lesson on identifying violations 8) Lesson night-time visibility

Diagnosis/Data collection program

Diagnosis is carried out using the data collected during the above driving lessons. Data from all the participants is collected for calculation of aggregates and statistics.

Replay function

The driving results can be replayed from various points of view.

Based on the standard of driving simulator : Standard scenario

1. Lesson on Hazard Perception

Hazardous events on the road are simulated on the Driving Simulator and users can experience the events by driving on the 5.5 km road with 13 hazardous event.

Pedestrians

Collision with a pedestrian

Turning corners

Collision with pedestrians on a busy road

Pedestrian rushing out from between parked cars

Red light running

Road objects and oncoming vehicle

Turning against traffic

Intersection without signals

Jumping in

Collision with a vehicle slowing do

Road works

2. Lesson on night-time driving

To acquire the knowledge and the skills for night-time driving, users can experience driving on a 5.5 km city road with 9 hazards

Collision with a pedestrian

Turning corners

Red light running

Overtaking a bicycle

Pedestrian rushing out from between parked cars

Lane restriction due to construction

Intersection without signals

Collision with a bicycle

3. Lesson on sudden braking

Braking distance on dry surface, wet surface and frozen surface based on certification standards

■Driving speed on wet surface and the braking distance

100km -> 0km (kph)	51.9m
80km -> 0km (kph)	35.0m
60km -> 0km (kph)	20.4m
40km -> 0km (kph)	9.2m
20km -> 0km (kph)	2.6m

4. Lesson on driving on the highway

Users can acquire the knowledge and the skills about driving on highways by experiencing driving on a 15 km highway with more than 8 hazards

Toll gate

Toll gate (ETC lane)

Toll gate (General lane)

Merging traffic

Main line

Truck Lane

Approaching emergency vehicle

Lane restriction due to construction

Exit

Falling object

Tunnel

Dense fog

Snowy condition

Rainy condition

Filling Station (Service Station)

Parking

Pedestrians'running out

Crossing with vehicles exiting

5. Lesson on location-specific conditions

Users can drive along a 8 km road to learn about location-specific conditions including different climate and geographical features.

Hill start

Passing by ona narrow road

Oncoming vehicle's crossing over at a corner

A narrow tunnel

Downhill(engine brakes used)

Animalscrossing

6. Lesson on driving in bad condition

Users can experience the driving knowledge and skill by driving over 5 km length road featuring 5 sections with bad driving conditions.

Rainy condition

Dense fog

Snowy condition

Oncoming two-wheel vehicle's crossing over

Drive on a dirt road

Turning corner on a snowy road

Passing near a pedestrian in the rain

Construction site in the rain

Drive on the water-covered road

Optional Scenarios

7. Lesson on identifying violations

Examines the responses to cyclists rushing out, pedestrians and stopping vehicles at an intersection

Collision with a bicycle

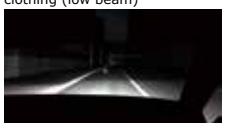
Collision with a stopping vehicle

Collision with a pedestrian

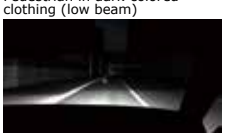
8. Lesson on night-time visibility

Experience night-time driving using headlights.

Pedestrian in light-colored clothing (low beam)

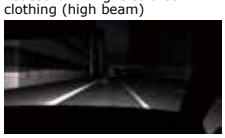


Pedestrian in dark-colored clothing (low beam)

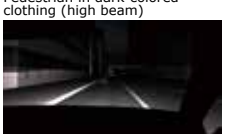


Road works

Pedestrian in light-colored clothing (high beam)



Pedestrian in dark-colored clothing (high beam)



Pedestrian in dark-colored clothing (high beam)

Replay Function NEW

The driving situation can be reviewd from the various kinds of viewpoints. The viewpoints can also be changed to adjust the direction and zoom in.

Driver's view

View from the back of the vehicle

Satellite view

View from oncoming vehicle

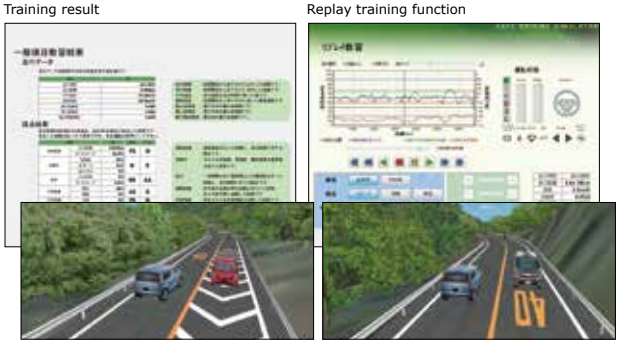
Diagnosis and data collection program

Diagnosis program

Results are produced from the data collected during the driving lessons.

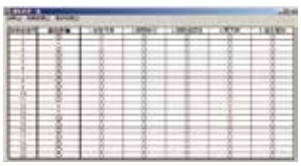
Training result

Replay training function



Data collection program

Data from all the participants is collected for calculation of aggregates and statistics.



By using replay function of UC-win/Road, it's possible to play and evaluate the driving record.

UC-win/Road Driving Simulator for seniors

Simulator to evaluate the driving ability for seniors and beginners

Simulator basic system price
US$52,800〜

Science and Technology, Meijyo University involves the use of driving simulator to confirm the decline in cognitive skills, and to assess and improve driving skills

(from documents created in the Yamamoto / Nakano Laboratory in the Department of Information Engineering, Faculty of Science and Technology, Meijo University)

Simple Driving Simulator for Seniors

Diagnostic function

① **Diagnostic Driving**：Drivers finish driving on diagnostic mode (without any advice). In case the accidents or problems occur, go to ②.

② **Diagnosis**：Analyze the results using the log and confirm the automatic diagnostic results. In case of the management system via master system, not only the diagnostic results but also information and elements used for diagnosis will be displayed (Displaying not only the diagnostic results on the drivers' screen but also the data of subjects can make the advice and explanation easier to understand.).

③ **Training**：Start over with advices following the diagnostic results. Training flow

Training flow

Measure and assesses driving behavior of senior drivers

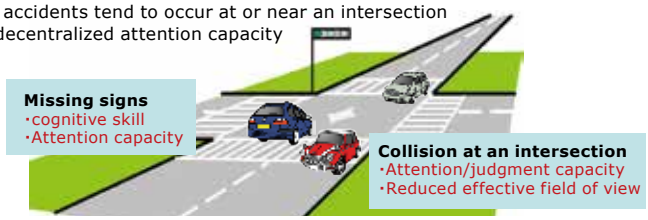
▼Accidents involving senior drivers are increasing. Degradation of driving skill (vision function and cognitive skill in particular) among seniors and them not being aware of it are the main causes.

▼Objective of this research is to develop a method and system for assessing driving skill from the driving behavior of senior drivers.

▼A method of assessing driving skill based on the overall score given to the driver's visual function and cognitive skill, both of which are measured, will be developed.

Analysis on traffic accidents involving senior drivers

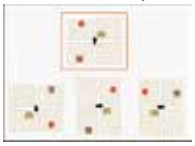
・More accidents tend to occur at or near an intersection
・Low decentralized attention capacity

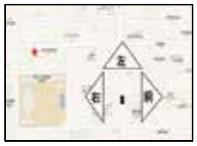


Training method

・Revitalizing prefrontal cortex→This part of brain relates to attention capacity and the ability to take right actions
・Revitalizing parietal lobe→This part of brain relates to exercise and visual information (processing spatial information).

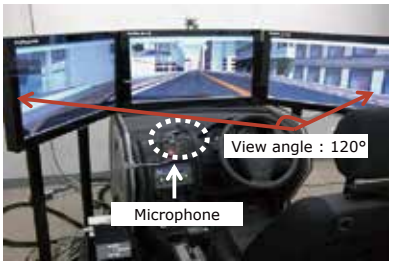

Counting
(revitalization of prefrontal cortex)

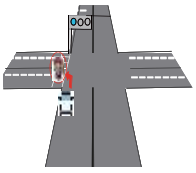

Inverted maps
(revitalization of parietal lobe)

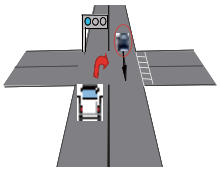

Stroop effect
(revitalization of prefrontal cortex)

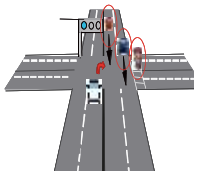
Simulator for Driving skill measurement

・Measures driving behavior of driver under realistic driving condition.
・Quantitative assessment of driving skill (vision and cognitive skill) by measuring driver behavior.




Driver stress: Low
(Pedestrian only)

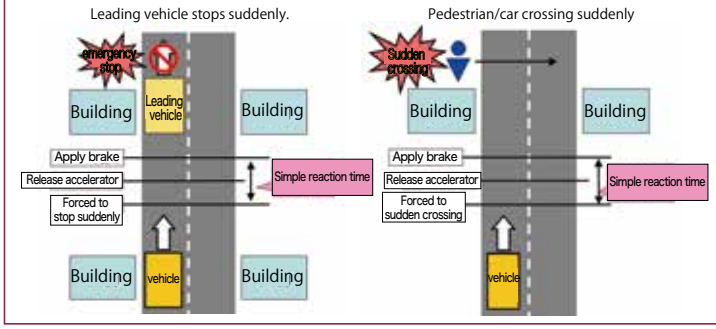

Driver stress: Medium
(On-coming car only)


Driver stress: High
(Pedestrian + on-coming traffic)

Validation experiment on the effectiveness of training

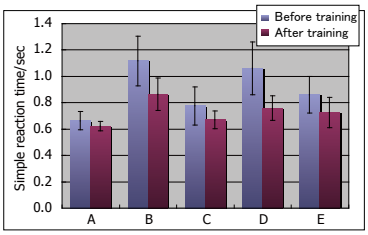
1. Experiment method
・Assess degree of improvement of driving skill (simple reaction time) by the looking at the difference in score before and after the training.
・Subjects: 15 seniors aged 65 and over
・Training period: Approx. 5minutes
・Measuring period: Approx. 5 minutes before and after training

2. Measuring method

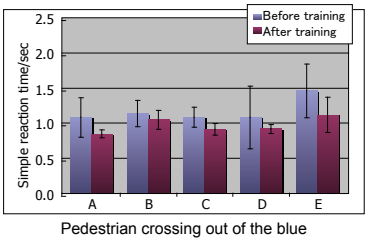


3. Experimental result
(Leading vehicle / sudden crossing)

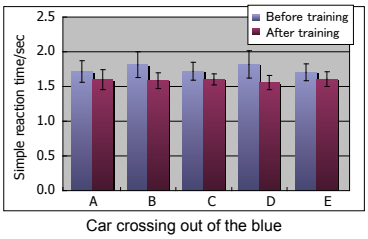
After training, simple reaction time decreased and the variation in simple reaction time among subjects evened out.



Leading vehicle stops suddenly



Pedestrian crossing out of the blue



Car crossing out of the blue

Method of measuring/assessing driving skill

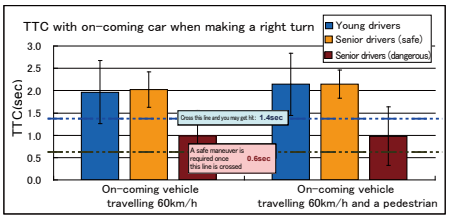
Method of measuring visual function (effective field of view)
・Displays visual target within the driving scene
・Assess the percentage of visual target recognized
(No. of targets recognized / No. of targets missed)
・Field of view can be measured using 3 LCD displays that provide peripheral view.

A method of measuring cognitive skill
・Assessment based on Time to Collision (TTC) with on-coming car when making a right turn
・Judgment line drawn based on technical index on automatic break stipulated by the Japanese Ministry of Land, Infrastructure, Transport and Tourism.
・4 stress levels are established based on the speed of on-coming car (40km/h & 60km/h) and presence / absence of pedestrian

TTC results

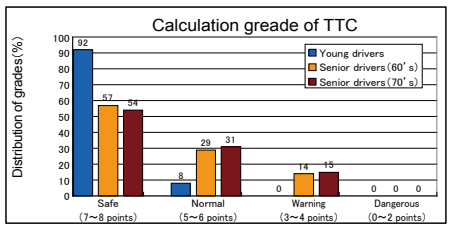
・Revitalizing prefrontal cortex→This part of brain relates to attention capacity and the ability to take right actions
・Revitalizing parietal lobe→This part of brain relates to exercise and visual information (processing spatial information).

Subjects :
12 young people
10 senior people



valuation standard for turning right

Safe driving:1.4≦TTC (2 points)
Warning driving:
0.6 sec ≦TTC<1.4 sec(1point)
Collision:TTC<0.6 sec(0 point)



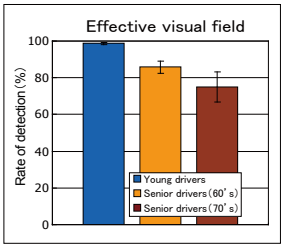
valuation standard

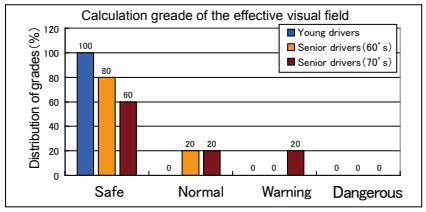
Safe: Total 7~8 points
Normal: Total 5~6 points
Warning: Total 3~4 points
Dangerous: Total 0~2 points

Driving ability is going down with age (TTC decreases)

Measured results of effective visual field

valuation standard
80% or more:more than 60% and less than 80%:normal
more than 40% and less than 60%:worning 40% or less: dangerous

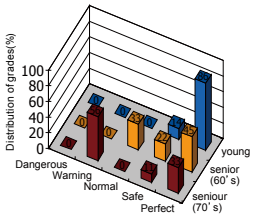




Comprehensive evaluation

After driving skill assessment, a majority of drivers in the 70s were classified as those that need "Attention".

results of effective visual field \ TTC results	Safe	Normal	Warning	Dangerous
Safe	Perfect	Safe	Normal	Warning
Normal	Safe	Normal	Warning	Warning
Warning	Normal	Warning	Warning	Dangerous
Dangerous	Warning	Warning	Dangerous	Dangerous



A method of detecting a decline in driver's cognitive skill

As Japan becomes an aged society, the percentage of senior drivers and those with dementia is increasing, and renewing seniors'driver's license is becoming an issue. A technique of detecting a decline in driver's cognitive skill based on his/her driving behavior while he/she is experiencing the driving simulator was developed.

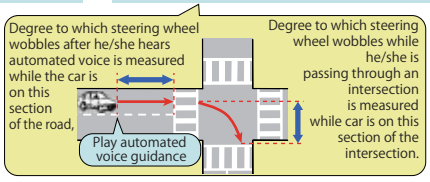
Tests to assess driver's cognitive skill and signs of low cognitive skill

1. Driver is distracted when someone talks to him/her
①Degree to which the steering wheel wobbles is measured
②Degree to which the steering wheel wobbles while the

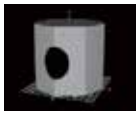
Angular displacement of steering wheel is found from the measured data → Compute the maximum value of vehicle's angular velocity → Measure the degree to which steering wheel wobbles right after driver hears an automated voice guidance and while he is passing through intersection.

Right rotation is positive, left rotation negative

Measured data sampling rate is 30fps



2. Field of view decreases whilst driving (especially when there are multiple visual targets)
③Driver is asked to give the number of visual targets he perceived as he/she approaches the intersection (measure effective field of view)



4. 2 visual targets (left picture) are displayed near each of the 4 intersection.

Percentage of perceived visual targets = Number of perceived visual targets / Total number of visual targets (4 intersections x 2)

3. Car tends to get in the way of pedestrian more often
④Time taken to react to pedestrian crossing out of the blue: (b-a)
a :Time of day when the pedestrian crosses out of the blue
b :Time of day when driver releases accelerator and steps on brake

(From "Guideline to driving behavior of drivers with dementia" written by Manabu Ikeda of Kumamoto University)

Evaluation method

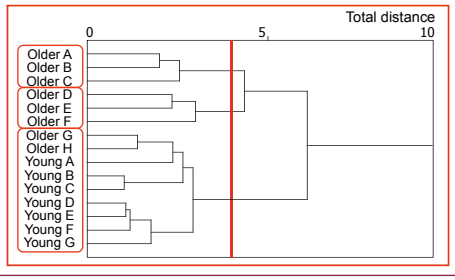
Medical diagnosis (Five Cog. Examination)
Suclects:8 senior people(older than 65) ,7young people(20's)
Out of 8 seniors → 4 were normal, 4 were diagnosed with AACD
※AACD (Aging-associated Cognitive Decline):
Decline in cognitive skill due to age (those at risk of dementia)

Each subjects were classified into the following categories based on the result of the Five Cog. Exam

Seniors that may be suffering from AACD	healthy seniors	young people
4	4	4

Evaluation via driving simulator

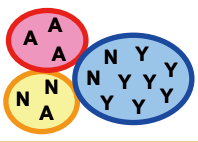
Hierarchic clustering based on the Ward method that uses the above 4 test results.
(Tree diagram with hierarchic clustering)



Evaluation results

Comparison between the result of medical diagnosis and the result of test done using driving simulator. Subjects were classified into the following categories: Seniors with AACD, healthy seniors, and young people.

		Five Cog. Examination		
	Number of people	Seniors(AACD)	Seniors (healthy)	Young people
		4	4	7
Seniors(AACD)	3	3	0	0
Seniors (healthy)	3	1	2	0
Young people	9	0	2	7



Clustering results
:Seniors with AACD
:healthy seniors
:young people

Five Cog. results
A:Seniors with AACD
N:healthy seniors
Y:young people

Test to detect a decline in cognitive skill by measuring driver's behavior, a test conceived from this research, proved to be effective.

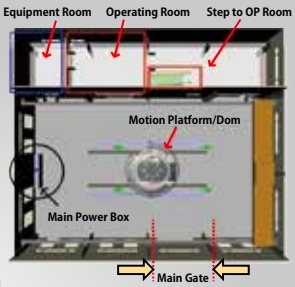
8DOF Traffic Safety Simulator

The high performance large-scale Driving Simulator

8DOF Traffic Safety Simulator is the high performance large-scale Driving Simulator based on FORUM 8's Real-Time Interactive 3D Virtual Reality Simulation & Modeling Software UC-win/Road. This was planned and built for the Research Institute of the Highway Ministry of Transport in China (RIOH) to be used in their traffic and safety research work in accordance with their detailed specification. In January 2009, FORUM8 received the order for customized development of this Driving Simulator an international tender and in February 2014, the Final Acceptance Test was complete, marking the completion of the entire project.

Image of the total system

The accompanying photograph shows the 8 degrees of freedom vehicle simulator which is based on a 6 degrees of freedom motion platform plus Yaw and X tables.
This system allows the user to be immersed in an extremely realistic environment, as similar to the real world as technically possible by utilizing a 360 degree view projection system within the dome. This was made possible via the UC-win/Road cluster system (UC-win/Road is a real-time interactive 3D VR simulation & modelling software) along with the use of appropriate sound equipment and vibration devices etc.
The vehicle and truck cabin, which can be quickly and easily exchanged if needed, are set within a dome structure, along with the advanced management system including CCD camera, image monitor and recording system etc.
The traffic simulator and vehicle motion models consist of the most advanced system for measuring driver behaviour data, including eye-tracking etc., and are directly linked to UC-win/Road, which all leads to further advances within driver safety research.



Traffic Flow Simulator

Vehicle Motion Simulator

UC-win/Road

Expected outcome and functions

Function designed for driver behavior research

Having the ability to reproduce the driver's driving sensation accurately, the simulator enables the users to conduct driving behavior research to evaluate a whole host of 'human factors' which may affect road traffic system.

- Measuring and analyzing a driver's psychological characteristics and conducting research based on the results (lane change, acceleration / deceleration, turning, etc.)
- Researching the driving behavior of individuals divided into age groups (youth/adults/seniors, etc.)
- A function for researching the effects on traffic safety due to a variety of driver distractions (mobile phone, radio, etc.)
- The effect on traffic safety due to tiredness
- A function for researching the influence of alcohol, disease and drugs on traffic safety, and impaired driving behavior

Road traffic safety research functions

This simulator possesses road traffic safety research functions useful for research based on the status and design of the individual 'road' within the road traffic system.

- A function for road safety assessment at the design stage
- A function for road safety assessment at the management and maintenance stage
- Researching the technology for maintaining drivers' safety when they are traveling in special sections of the road (long downhill road, tunnels, sharp curves, intersections, etc.)
- A function that enables detailed research into driving safety under changing road conditions including lighting, induction, and visibility
- VR optimization design function for road landscape and traffic facility installation
- A function that enables detailed research on technology for maintaining road safety under conditions in which multiple drivers are operating within the same transport network

Traffic safety research under special environmental circumstances

This simulator enables the user to investigate the effects and subsequent driving actions under a range of different environmental conditions.

- A function for traffic safety research under bad weather conditions (fog, ice and snow, high and low temperature, snowstorm, wind, etc.).
- A function for traffic safety and emergency and security countermeasure research under extreme traffic conditions (traffic accidents, abnormal traffic incidents, etc.).

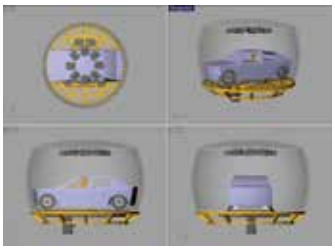
Other Functions

As the FORUM 8 Driving Simulator can faithfully reproduce the real driving sensation it has many other applications in driving behavior research.

- A function for reviewing traffic safety criteria and rules; the function also includes various other related technical features.
- A function that enables the validation of the latest in-vehicle ITS systems
- A function that reproduces traffic accidents and judicial test function.

DOME

Order Made Dome Structure and FRP Screen
The dome is composed of 8 sheets of flange type FRP panels. FRP is a hard and light material that covers the vehicle cabin whilst also functioning as a screen for the projection system.



System Configuration

Driving Simulator

Driver mock-up

Driver Behavior (human)

Eye Tracking System

Host Computer

Visualization of vehicle dynamics environment
⇒Can evaluate a whole host of 'human factors' which may affect road traffic system based on experiment / measure human response.

Traffic Flow Simulator (PTV Vissim)

Simulation of ITS Signal

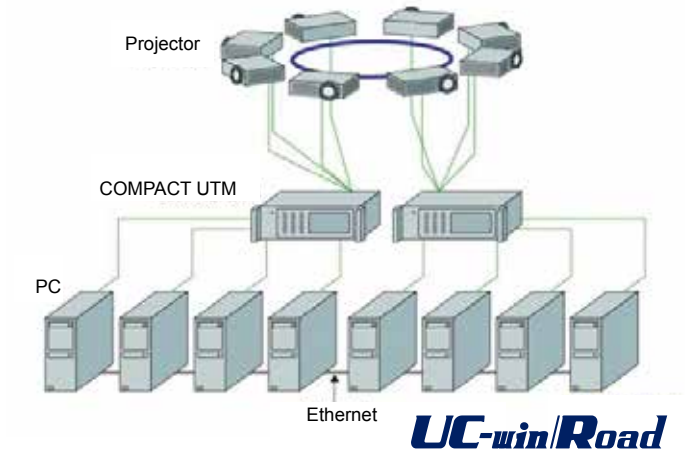
Reproduction of real roads and virtual test courses within the 3D virtual environment.
⇒Accidents and traffic congestion can be reproduced

Vehicle Motion Simulator (CarSim/TruckSim)

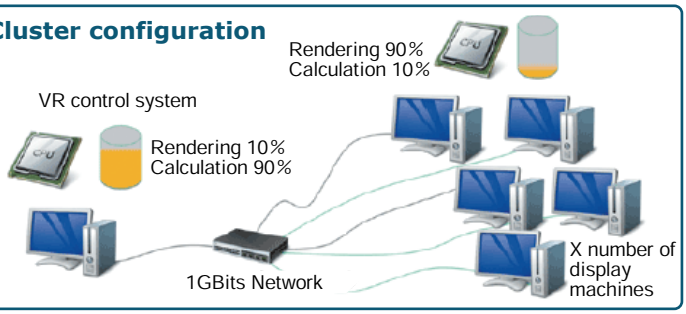
Reproduction of vehicle dynamics
⇒Various types of vehicle can be simulated

Cluster Computer System

The Cluster Computer System is composed of 1 master PC for control and another 8 PCs for display. Each channel is rendered using its dedicated display PC, and 8 display PCs are synchronized using the master PC, allowing the projection of a video to the 360°doam-shaped screen.

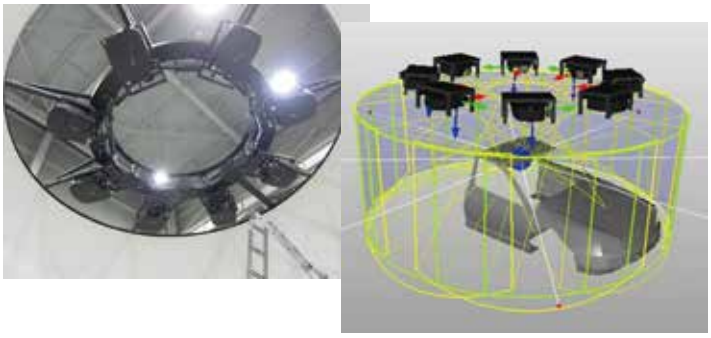


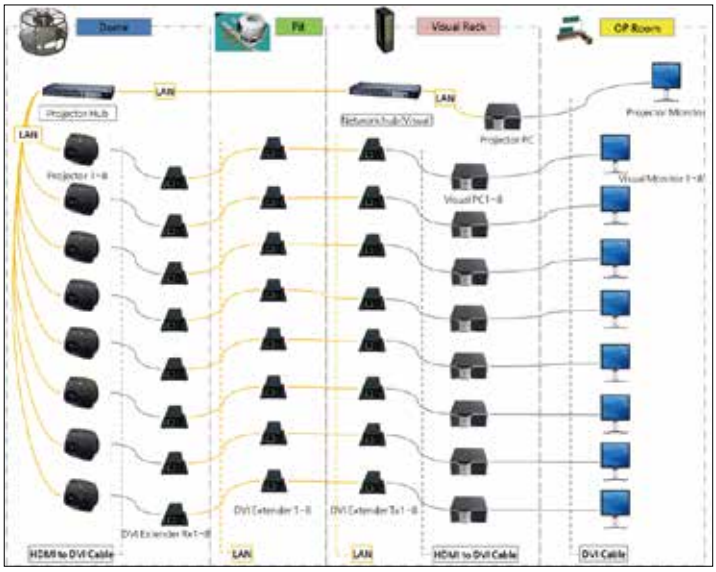
Cluster configuration

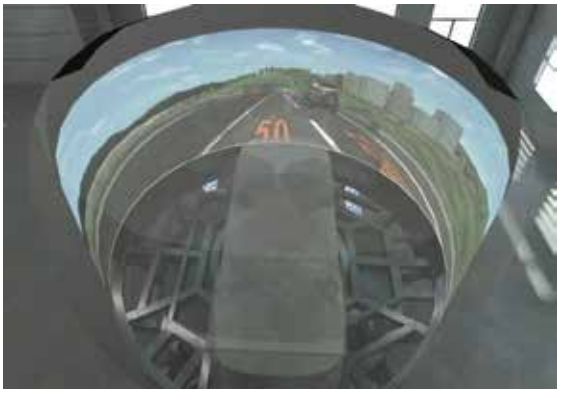


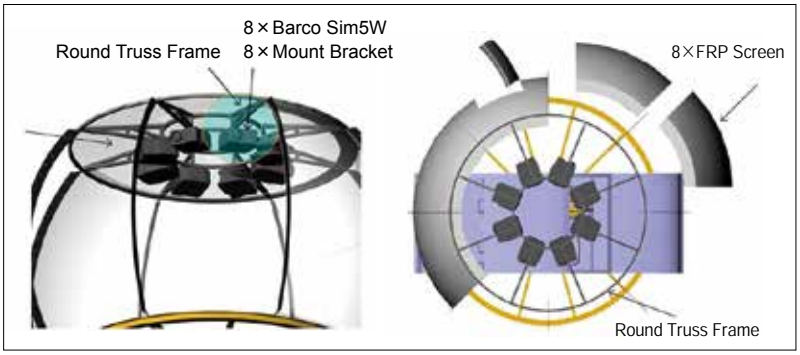
Multi Projector System (8 units)

Barco SIM5R Projector
The multi-projector system within this high-performance simulator is composed of 8 individual projectors. Using edge blending technology, the system provides a 360°simulation environment for the driven vehicle. The direction and angle of the projectors was determined after simulation verification by an expert consultant. The projector system is structured in a way that does not obstruct the driver's view.





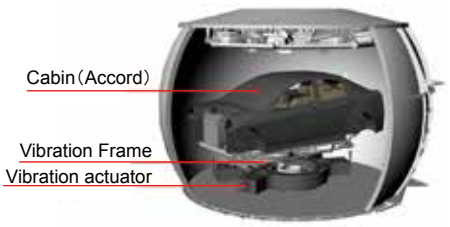


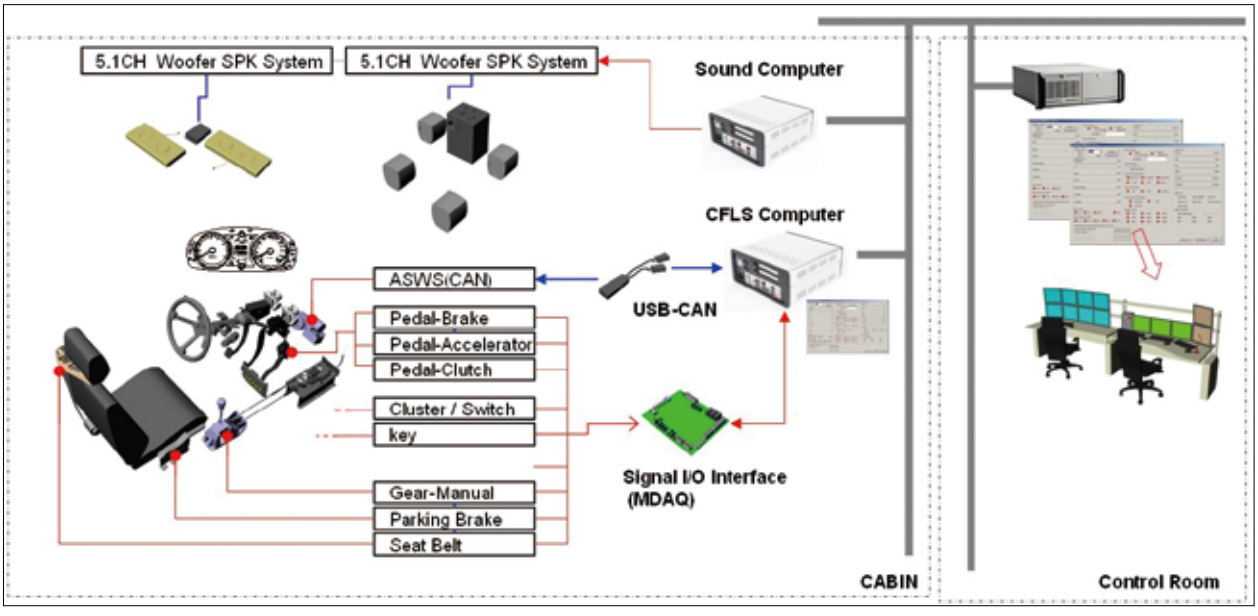


▲Barco SIM5R Projector

Real Car Cabin (Honda Accord)

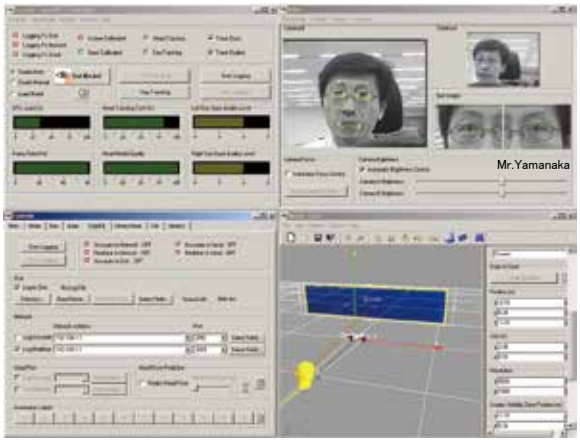
The simulator incorporates the real cabin of a Honda Accord. The engine was removed to be replaced with equipment such as the electronic control system and acoustic PC. A PC power and a connection terminal for Internet connection has been placed inside the cabin. The original vehicle's steering wheel and accelerator / brake pedals are used to help achieve the real driving sensation.





Eye tracking System

face LAB is a product developed by Seeing Machines Inc., a spin-off company of the Australian National University (ANU). This system measures the motion of the face based on information from two video cameras that automatically track the person's face in real time. This software captures the facial features 3 dimensionally from an image, extracts the facial features and tracks these features. When a facial feature changes on the screen, it will keep tracking even when the head rolls fast or when part of the image of the face on the screen is distorted, by choosing a new feature dynamically. The output data is; eye movement, position of the head, rotation, tightness of the eyelid, movement of eyebrows and lips and the size of the pupil (pupillometer). A person's face naturally tells you a great deal about their mental state. By using this system we can measure a person's intentions and the degree of attention from examining the person's countenance.



Standard VR Model (UC-win/Road)

In addition to the ability to create VR models for driving simulation, UC-win/Road is equipped with the following 4 standard model types. All of them are real time VR models that can make effective use of the features of the driving simulator modeled from real roads. It provides a flexible driving environment by means of the scenario function, environment switching function and the switching of cabin and motion model.

■Urban Road VR Data

As part of the project we reproduced the urban area road network of the Chinese capital city having the "No. 3 loop line" of Beijing city as the center. Modeling all lines' road signs, marked lines (Chinese GB5768-2009 criterion correspondence) and guide plates, and placed them in accordance with local video coverage. Dozens of wide roads with widths of more than 4 lanes on one side and "solid cross – bridges" which are intersections of radiation path and loop line have been created, faithfully reproducing the road infrastructure, railroads and buildings. In addition to the landmark buildings, such as the venue of the 2008 Olympic the "bird's nest", the 3D city model realistically reproduces Beijing's urban loop line network and the overall sense of urban space.

■Highway VR Data

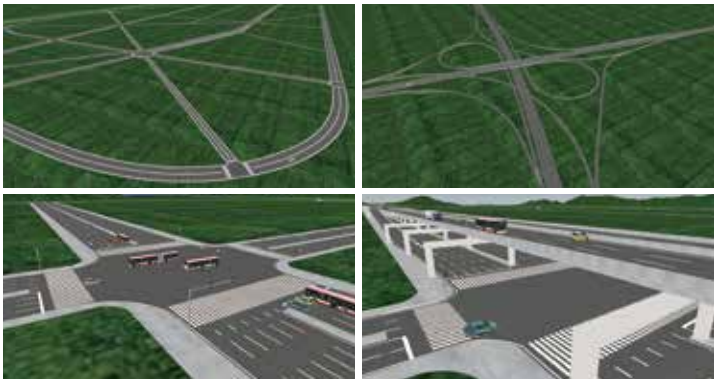
An actual VR model of national road G110 was created. The conventional common national road with two-way two-lane has been extended to 2 one-way two-lane roads, separated from each other but running in parallel. The data creation was based on the design diagram of the extended road under construction. This model realistically reproduced the scene common to road construction sites in which passing vehicles are mainly large trucks. There are also various special environmental conditions built in such as rain and snow. Even a frozen road surface can be experienced from the driver's perspective in the driving scenario. The VR data has been designed to provide the optimum driving environment, allowing faithful reproduction of the vehicle behavior and driving sensation.

■Mountain Road VR Data

This is a VR environment reproducing part of the national road G109. It has been designed to faithfully reproduce the road structure to provide a realistic feeling of acceleration and centrifugal force to the driver, especially when the vehicle passes a curve of a different radius. The continuous curve in the VR space was created based on a video recording of the real road. The whole 3D environment was created based on the on-the-ground research photos such as those depicting the gutter structure of the road cross section, drainage ditches and the texture of the cut earth.

■Infinite Loop Road Data

This VR environment was produced to research 'fatigue driving' in which the driver keeps driving indefinitely using the newly developed "traffic connection" function. A typical Chinese cross-section is applied for the road structure and for the traffic flow of vehicles, road information was obtained from actual on-the-ground research which faithfully reproduces the traffic flow.



Human-Vehicle-Traffic Flow Interoperable Driving Simulation System for Interactive Information Exchange

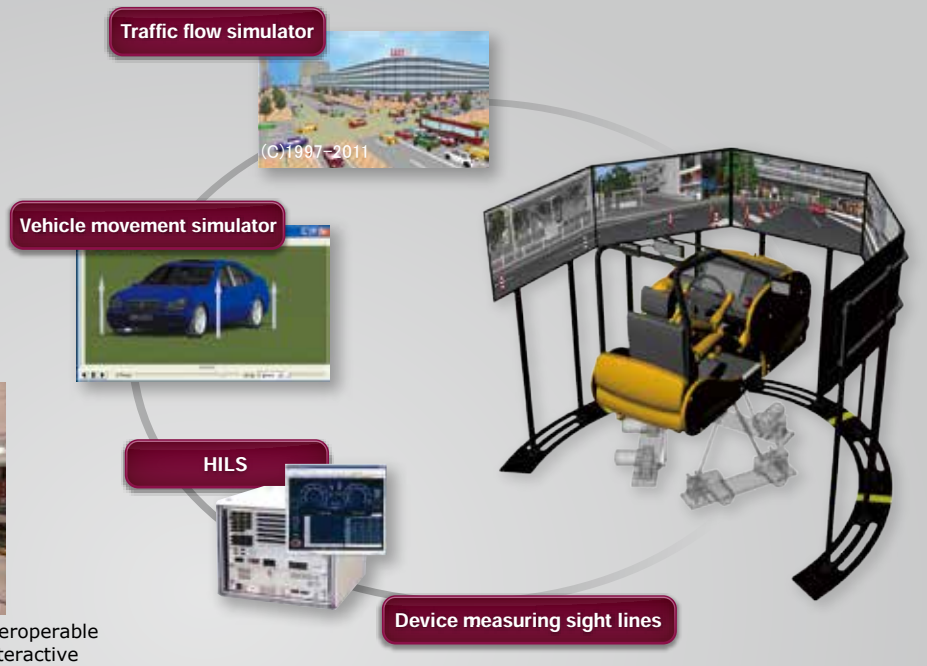
Driving Simulator with 6 Degrees Of Freedom 0.7G motion platform for highly sophisticated research purposes.

FORUM8 delivered research-purpose driving simulator referred to as "Human-Vehicle-Traffic Flow Interoperable Driving Simulation System for Interactive Information Exchange" to Kyushu University Graduate School of Integrated Frontier Sciences on March 22, 2012. The driving simulator will become the driving force for educational research activity on the next generation information/control devices in vehicles.

UC-win/Road

By linking the driving simulator, traffic flow simulator, vehicle dynamics simulator, HILS/ECU emulator, and eye tracking system by integrating them all into UC-win/Road, the simulation function has been enhanced.

▲Human-Vehicle-Traffic Flow Interoperable Driving Simulation System for Interactive Information Exchange



Expected impact and the features of the driving simulator

[Impacts] The linkage of the driving simulator, traffic flow simulator, vehicle dynamics simulator, and HILS/ECU emulator will in effect promote the educational research activity on the next generation information/control devices in vehicles.

Providing an experimental environment for in-vehicle system under development, it can

- **Reproduce virtual test courses and actual roads via simulator**
- **Reproduce virtual test car via driving simulator**

- **Vehicle experiment too dangerous to perform on real test course (replaying accidents / traffic congestion) can be done within the safe confines of the simulator.**
- **In-vehicle system experiments can be done efficiently through test course**

[Applicable in a various important disciplines]

- Driving Assistance System
- Electric Power Train Motor/ Battery system / Inverter
- Next generation car navigation
- ITS Contents
- Model-based development of ECU embedded hardware/software
- Control signals
- Predict the effect of traffic infrastructure
- Accident analysis
- Driver characteristics analysis

Research-purpose Driving Simulator has been delivered to Kyushu University.

This driving simulation system was realized by linking the driving simulator, traffic flow simulator, vehicle dynamics simulator, H I L S/ E C U simulator, and eye tracking system and integrating them all into UC-win/Road. On May 13, 2012, the driving simulator was exhibited to the public for the first time since its delivery as one of the highlights of "Kyushu University Festival"held on Ito campus to commemorate the university's 100th anniversary. 106 people, many of them families, lined up to test drive the state-of-the-art simulator.

The virtual test course is a 2 minute run that starts from a point in Taihaku-doori - a main street that runs across Fukuoka city - near FORUM8's Fukuoka Business Office and ends at Hakata station. Test drivers got very excited during the course of their drive as many of them acclaimed the driving simulator's cutting-edge technology by giving comments like "I'm really impressed with its ability to visualize so many aspects of the real world with high degree of realism. The image I'm seeing on screen is very pretty."FORUM8 delivered another research-oriented driving simulator (6DOF 5 Channel) on March 2012 to Faculty of Engineering, Kyoto University Graduate School of Engineering, Kyoto University.

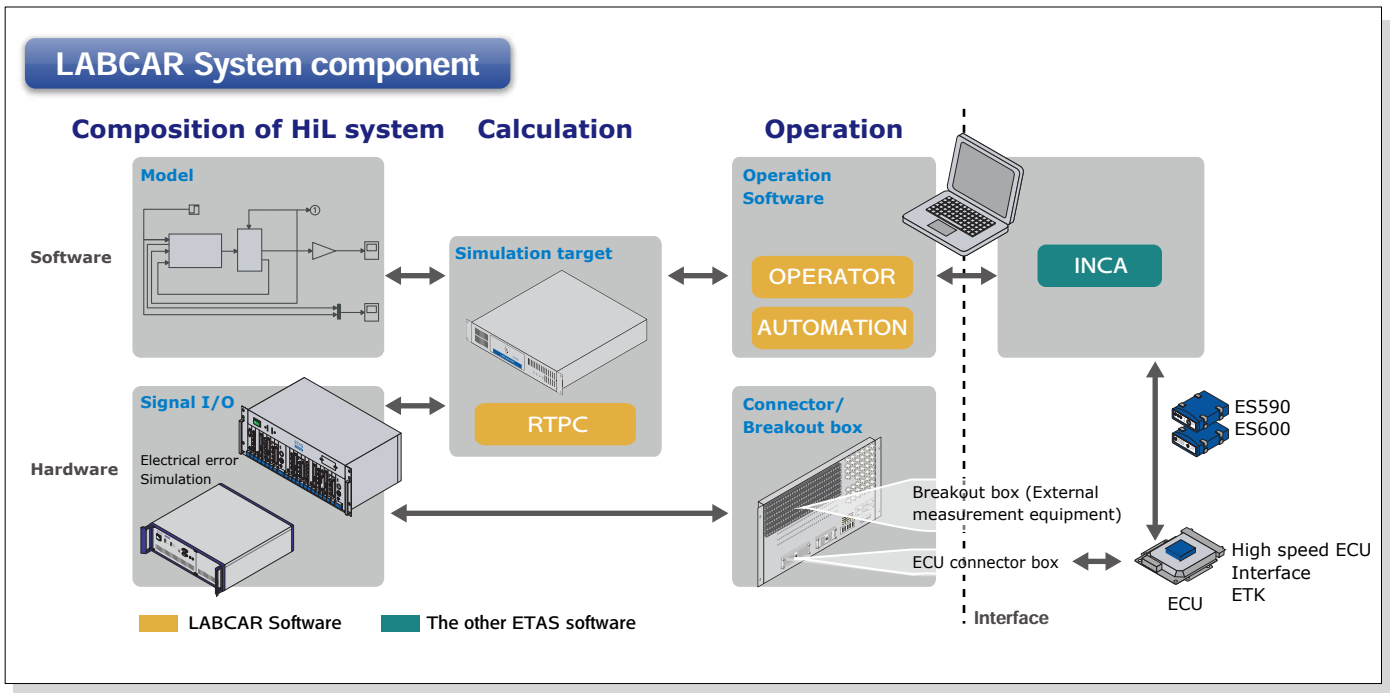
HILS (Hardware in the Loop Simulation)

■LABCAR HiL test system

It is a real time test system for a compact on-board ECU. By carrying out a simulation which is necessary for the action of the ECU using a model composed of a driver, vehicle, and a driving environment, a test of control and diagnostic function of ECU can be conducted smoothly in the laboratory.
It is composed of simulation model, software, hardware, test automation function, and time synchronized ECU access, etc., and it has become a system architecture that is module structured and open oriented.

■Cooperation image of UC-win/Road and HILS

By taking out driving operation (accelerator, brake, and steering operation) from the driving simulator and environmental conditions (elevation difference of the road surface and friction coefficient ,etc.) from UC-win/Road, analyzing dynamic behavior in the vehicle dynamics of the HILS side, and feedback on the behavior of the host vehicle, it represents a realistic VR driving in UC-win/Road.
The communication between the two is done by UDP or TCP/IP.



①Simulation target

A component to be the core of the test system. A dynamic simulation of physical control process is also possible.

②Hardware (Signal I/O)

It is composed of product groups such as module structured VME hardware, error/load simulation, adaptation module, and breakout panel. Various VME cards for standard application for vehicle can be used, and a variety of I/O cards (analog I/O, PWM, rotation synchronization signal generation, etc.) for signal generation and measurement are available.

③Connector breakout box

Supports ECU signal system 300ch and large current system 50ch. Furthermore, various connectors for accessing external measurement equipment, actual physical component, and external experimental system are equipped.

④Operating Software

It is a component to be the base of all LABCAR applications. It possesses various functions such as control of the experimental environment, management of the experimental data, virtual measurement, and connector of the C code model part.

■ECU emulator

The Ethernet based interface ETK/XETK, developed by ETAS, can access directly to the control variable and the parameter, and it has become real time supportable. By the dedicated power supply independent from the ECU, preparation of a cold start test without energizing the ECU is possible. Installation inside the ECU for mass production is possible due to the compact shape, and it possesses a wide range of durable temperature and an excellent seismic resistance specialized for the use in a harsh in-vehicle environment.

Developed by ETAS, Inc. http://www.etas.com
TEL : 045-222-0900 FAX:045-222-0956

UC-win/Road Customization System

Train simulator (train traveling simulator)

Train Simulator for R&D, Education & Training, PR & Exhibition

•It has various applications
For research and development of cars and human engineering, for educating or training crews, for exbition in museums and train expo, train driving game and so on.

•From large one to small one
From entire cab including real scale crews' room, wide screen, and motion platform, to simplified version having only part of driver's console and PC screen for displaying.

•Handling to both CG image and video image
Depending on the situation, you can use CG which has high degree of freedom or video footage which excel in reality.

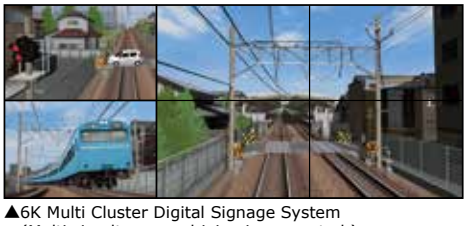
•Generation of simulated situation which gives you a realistic feeling
Generation of simulated vision with high quality image and high drawing speed, sound produced by multichannel and multispeaker, motion platform giving the real feeling of acceleration and deceleration.

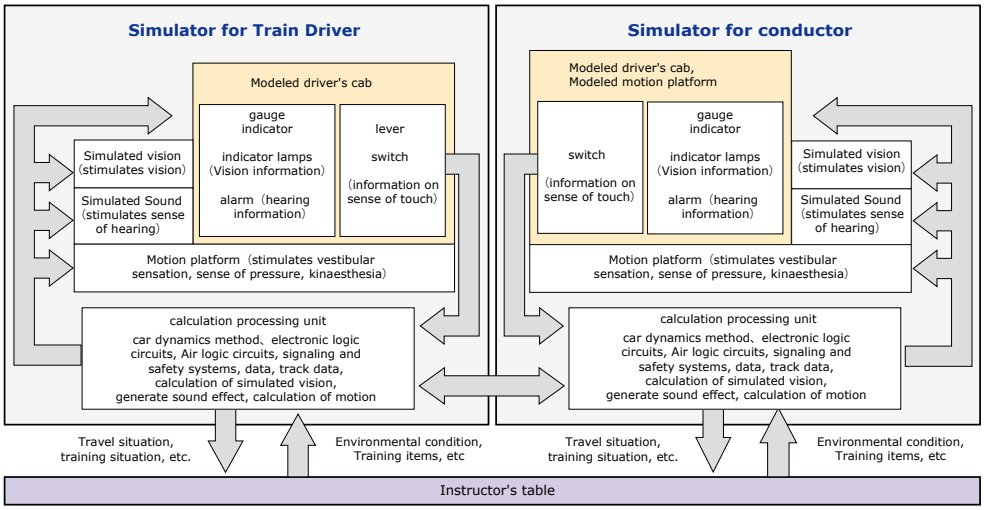
•Simultaneous driving feature
Multiple trains/cars can be driven within the same environment, reproducing an even more realistic traffic condition.

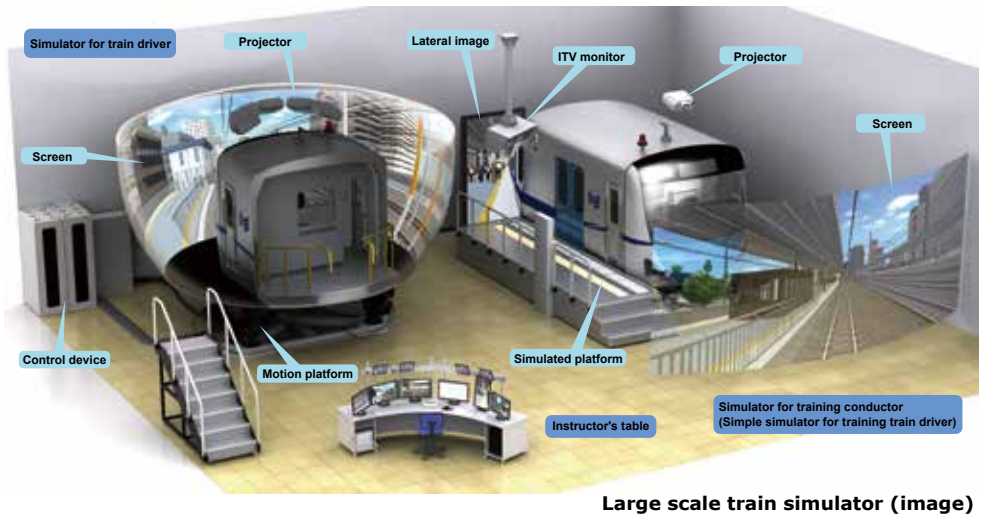
▲High driving freedom degree CG

▲The best video image for museum and train exhibition


▲Compact Driving Simulator


▲6K Multi Cluster Digital Signage System
(Multi simultaneous driving is supported.)





Large scale train simulator (image)

Train signal visibility system

Customization from Japan Railway Construction, Transport and Technology Agency, delivered in 2010.

Visibility system for various kinds of facilities for train railway using 3DVR function of UC-win/Road

- Visibility system for various kinds of facilities for train railway using 3DVR function of UC-win/Road
- The following basic items can be input as facilities which are related to visibility
  Tunnel / cut earth / bridge over railway / sound barrier / lower way truss / platform / power pole

▲Visibility check when passing by an oncoming train

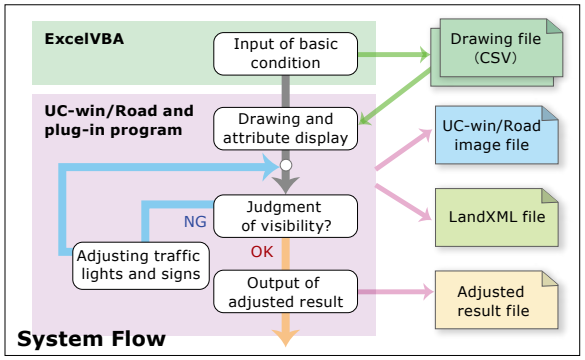
▲Top menu

▲Input the linear information

10th 3D·VR Simulation Contest
System for checking the position where equipments are installed
Japan Railway Construction, Transport and Technology Agency

▲Automatic stop

▲Positioning



UC-win/Road Features on railways

Parametric 3D modeling

Sign, stairway, escalator, fence by parametric input can be generated. In case of stairway, the width, height, number of bars and texture can be assigned.

▲Electric bulletin board

▲Escalator / stairs

Railroad alignment / Railroad track

Ability to draw the centerline for railway surveying and the centerline of structure for construction surveying, transition curves and vertical curves, cant of a railway track, railroad switch. Trains can be made to travel over multiple tracks.
Transition Curves: Clothoid, Cubic parabola, Sine half wave length curve
Vertical Curves: Secondary parabola, circular curves

▲Expression of railroad switch

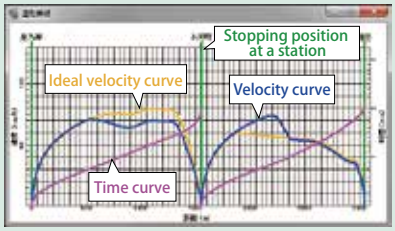
▲Ability to confirm visibility of traffic lights

▲Simulation image

Driving curve feature

- Continuously graphs the position of the traveling train, velocity, and time.
- Timetable with efficient schedule can be generated.

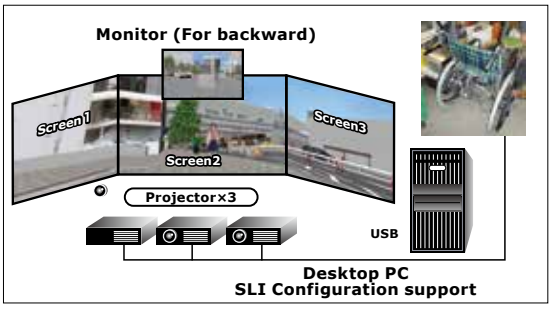
Time curve (pink) : The longitudinal axis is time and horizontal axis is distance. Train simulator via UC-win/Road records and draw the velocity and time with respect to each 5m going ahead.
Velocity curve (blue) : The longitudinal axis is velocity and horizontal axis is distance. The ideal velocity curve between stations is displayed in yellow.



wheel simulator

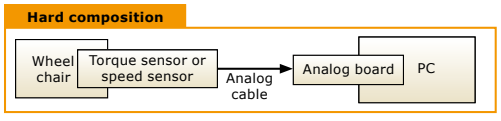
Up&Coming Vol. 91 Collaboration news introduction

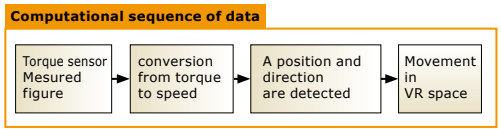
The VR environment of UC-win/Road is used for the video display part of the wheelchair simulator which is the research development result of Professor Jun Kurata, Kansai University Science and Technology Department.
The model of speed and road surface resistance are used as a movement model (dynamics) of a wheelchair.
UC-win/Road is utilized for the display portion. Furthermore, whether it can move inside of VR space is verified by reading the data of the actual measurement from a wheelchair simulator to UC-win/Road. The system that by acknolege-ment of danger in accident when wheelchair is used, further safety can be utilized in consideration of the individual grade and part of handicap.



▲Wheel chair simulator construction image

▲Wheel chair example by UC-win/Road MD3 character





▲Conflagtion diagram and flow of cooperation part with wheel chair simulator hardware

▲FORUM8 hosted "Simulation System Session" at a workshop of The Japan Society of Mechanical Engineers on September 11, 2012 and Associate Prof. Kurata gave his lecture titled "Development and use of wheel simulation system".

UC-win/Road Customization System

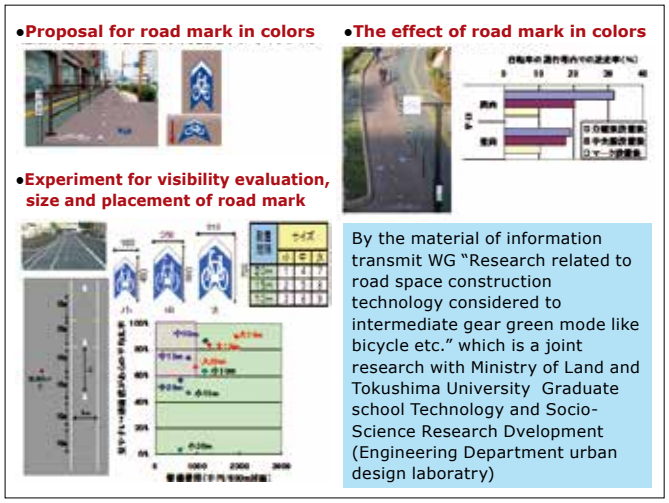
Bicycle simulator

Up&Coming Vol.91 User Introduction

In "traffic team instructed by " Professor Hideo Yamanaka, (Engineering Department urban design laboratry) of Tokushima University Graduate school Technology and Socio- Science Research Dvelopment, the Bicycle's simulator based on UC-win/Road is adopted for the development of bycycle's information display technology suitable for visual characteristics of users. It is possible to clarify the expected angle by the differences of the size of various signs and the posting interval or the influence which viewing time gives to visibility and to acquire the knowledge used as the standard of the information presentation suitable for the environment of bicycle use. Moreover, it is possible to build various experimental conditions as well as an eye mark recorder and a head posture sensor. By introduction of experimental system using drive simulator, upon clarifying a bicycle user's visual characteristic, it is utilizable for development and examination of an effective mark set in guidance and control of a bicycle for production of a road.

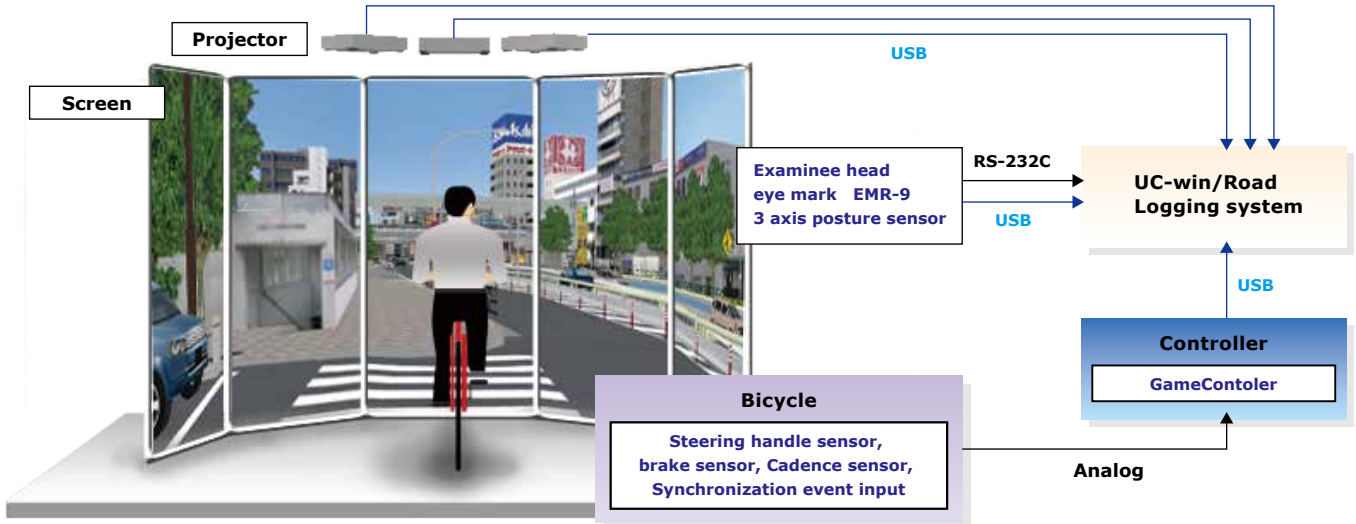
▲The experiment using bicycle simulator

▲Awarded for Technology Prize in FORUM8 Design Festival 2011



▲Example of signs for which the validation check are conducted by bicycle simulator.

Bicycle simulator configuration image



UC-win/Road Bicycle Simulator cycleStreet series City Edition

Up&Coming Vol.103 Collaboration news introduction

A virtual cycling system that allows you to feel as if you're cycling on the street, with sense of reality given by CG during the training on an exercise bike that tends to be dull.

UC-win/Road was used to add more strength and value to the virtual cycling system "Cycle Street Series City Edition" (Developer: FLOVEL CO., LTD.). To produce this system, the originally developed speed sensor is incorporated into a commercial exercise bike, and a DLL (dynamic link library) to read the rotation rate from it is connected. It is linked with a three-screen panorama display with VR CG created with UC-win/Road. The course of the system for exhibition, going around Shibuya Station, was built with the data created by FORUM8. When a visitor pedals the exercise bike, CG moves according the speed. It realizes mechanism to have one do exercises while enjoying urban cycling as if it were a game.

■Price

UC-win/Road Driving Sim	US$ 12,800
cycleStreet plug-in	US$ 1,000
cycleStreet hardware	US$ 3,000
PC / monitor	US$ 2,800
Total	**US$ 19,600**

UC-win/Road Ship Handling Simulator

Ship handling simulator with virtual reality

Ship handling simulator consists of a variety of 3D/VR space expression with UC-win/Road. It allows easy representation of a high accurate VR space in easy method, and the construction of simulator for a variety of applications using scenarios/event functions and motion platform techniques. This is not only for the training of sailors or students but also for the investigation of the harbor environment landscape with the simulation of its facilities.

Related plug-in option

- Motion plat form
- Micro simulation player
- Scenario
- Communication
- Log output
- SDK (Software Development Kit)

■Case example of developing ship handling simulator

▼Reference price　The hardware can be customized based on your budget and purpose.

Type name	Details	Reference price※
Normal	Projector x 3, Edge blending	US$75,500
3D stereo	Projector x 6, Edge blending additional hardware, Screen	US$128,900
Normal + Motion platform	Projector x 3, Edge blending 2 axis motion platform	US$238,000

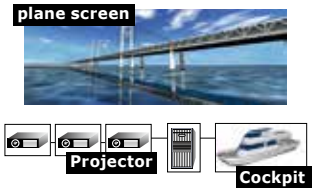
(※Total reference cost above including system development cost, not including the cost for PC, projector amd cockpit.)

Demo Simulator Description

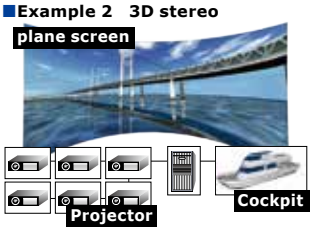
- ■Simplified simulator (UC-win/Road not included)
- ■Compact type for exhibition/demonstration
- ■Start/Stop button
- ■Handle, accelerator, brake installed

Example of configulation of 3D stereo ship simulator

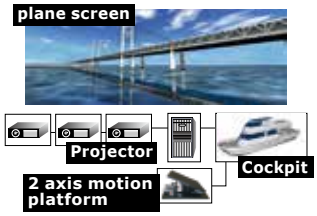
■Example 1 Normal



■Example 2　3D stereo



■example 3　Normal + Motion platform



■Example of configulation of 3D stereo ship simulator

▼Kobe port

Reference price of Kobe Port：US$ 26,000

▼Yokohama port

Reference price of Yokohama Port ： US$ 19,000

In anticipation of automatic construction

Man-machine interface Man-machine interface

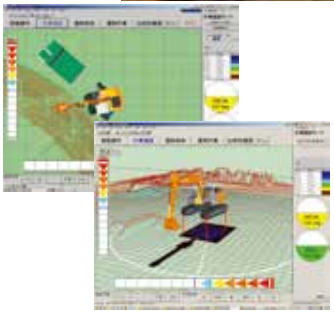
International version Japanese/English/Chinese/Korean/French

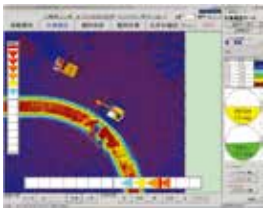
Joint research with "Japan Construction Method and Machinery Research Institute Public Works Research Institute"

(A study of informative construction by mechanization construction, 2007)

UC-win/Road has been mounted as a interface in operation side so that it can check current process and operating instructions in real time in 3D VR. We have also developed an operation function and implemented it and we have been checking by filed experiment.

1) **3D information (Photo, screen) :** It receives information from GPS, terrain laser scan, video camera which are mounted in a machine and a PC system which controls them via wireless LAN. The terrain data is displayed as 3D terrain data and the location and machine performance information is reflected to a machinery model which is positioned in 3D VR space as a movable model, so that it is capable to display their performance in real time.
2) **Operating instruction in constructions steps :** An operator indicates an order in each step through this interface so we studied and implemented the function which can switch displays such as "Plane", "section" and "3D" to operate easily.
3) **Cross-section screen display :** It is available to display current terrain and planed terrain line on cross-section which connects with the machine and excavated target so that we can check conditions of current terrain and planed terrain in real time.
4) **Work quality check :** It is capable to display planed figure and current figure which measured by laser scan, plane mess in piles then check it by values of work quality based on difference between current height and planed height and displaying gradationally.





Transfer operation
↓
Check operation
↓
Operate excavation
↓
Check work quality

Case example of developing simulator system

Simplified DS

■Matsuyama Office River and National Highway, Shikoku Regional Development Bureau, MLIT (Open House), 2005

■High Technology Hall@TEPIA (Machine Industry Memorial Foundation), 2008

■Construction Technical Pavilion (The Ministry of Land, Infrastructure and Transport Kanto ground Maintenance), 2007

■Prior to opening of Ohashi Junction Metropolitan Expressway Co., Ltd. 2009

■AMLUX Toyota Co., Ltd
TOYOTA AUTO SALON AMLUX TOKYO,2011

3D stereo DS

■Hamagin Space Science Center Exhibition: 3D image forum 2009

System development of 3D stereo view

3X2 polarizing stereo view DS system by UC-win/Road.
Silver cylindrical screen (R2400,165degree, AH1662)
Hanging stand Folder to hold polarizing filter

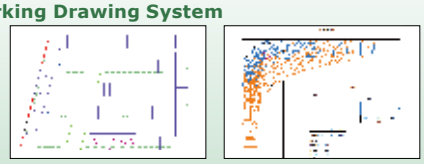
FORUM8 Parking Solution

E-Parking allows the reservation of parking spaces via internet terminals such as Smart-phones etc. E-Parking therefore solves the problem of searching for a parking space in busy urban areas whilst Parking Lot operators benefit from increased efficiency. Route navigation will be conducted by VR-Cloud® for the reserved parking lot. It doesn't need to prepare the information separately because the VR model including the parking is created. Moreover, the 2D display and the display of text information will also be possible if required. ※1…Only the terminal with GPS is applied.

UC-1 series
Civil engineering design software

Checking for vehicle trajectory, automatic design for parking lot

Vehicle Trajectory Mapping System Ver.3 / Parking Drawing System



UC-win/Road
3D・VR

3D simulation by aligning UC-win/Road and mapping information

Checking for vehicle trajectory

Checking for design

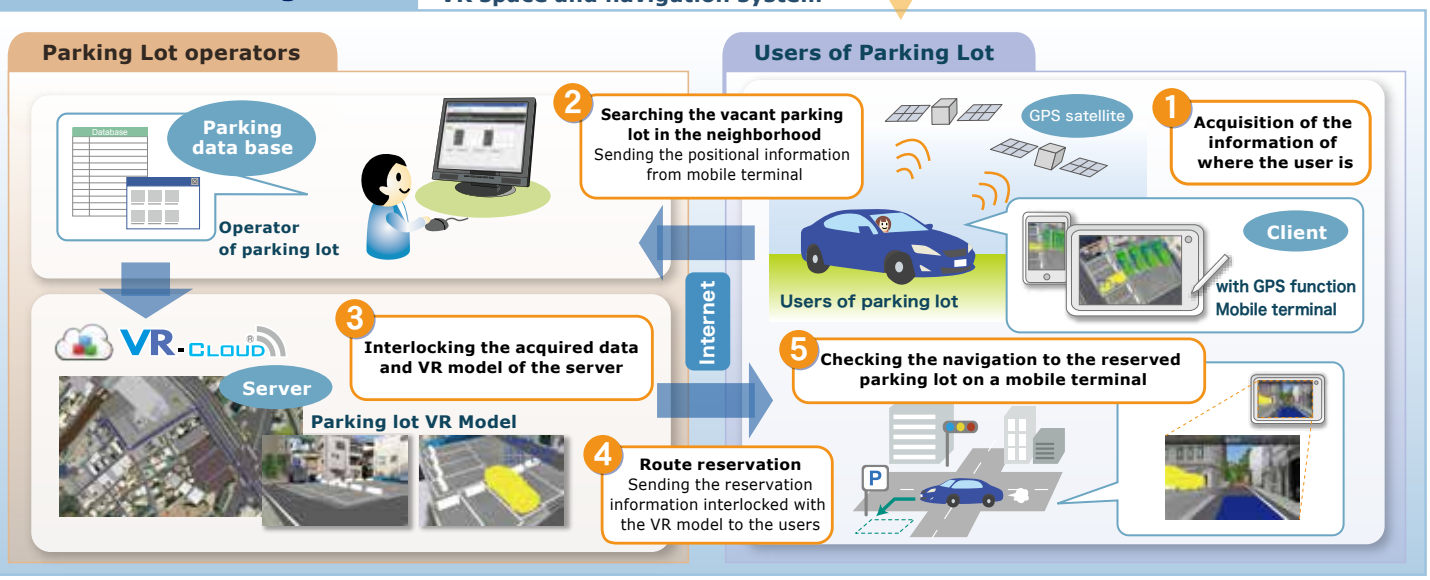
RoboCar®Auto parking

Automatic parking system by synchronizing VR model and RoboCar®

Automatic parking simulation via positioning system in augmented reality

VR-Cloud® Parking NAVI

Searching vacant parking lots using VR space and navigation system



■Flow of parking reservation on VR-Cloud® Parking NAVI System

1 Main menu

1. Select "Search parking lot" on a top screen. Available parking lot will be displayed on a list

2 Reservation screen

2. information. Input the required items and make a eservation

3 Navigation in progress

3. After applying, start navigating to the parking lot. Direction to travel will be displayed.

4 Parking position

4. Confirm the parking position and surrounding situation.

5 Route check

5. Route can be check again.

Development cooperation : Associate Prof. Kostas Terzidis (Harvard University, USA)

Searching vacant parking lots using mobile terminal with GPS and navigation system "e-Parking"

eParking is a social network system which enables sellers and buyers to exchange information and trade their parking spots by accessing through a smart phone app, facilitating and optimizing street parking in the city. In future implementations, the system can be embedded into vehicles as part of their GPS navigation system.

1. Database construction : Registration of parking spots, client, purchase etc.
2. Customer registers and inputs personal, car, and financial information.
3. A customer (seller) can set a price and time.
4. Another customer (buyer) may look for the available spots.
5-7. The buyer sends a message to the seller to the final deal is made.
8. A purchase is made and money is transferred from the buyer to the seller.
9. Database resides on a server or cloud servers

The 5th International VR Symposium Research Presentation

「E-parking Simulation」

—Associate Prof. Kostas Terzidis, Harvard University

He focuses on the possibilities of the parking business based on the floating rate system using mobile device and GPS, and introduced the development of the simulation with UC-win/Road to assess the viability of E-Parking

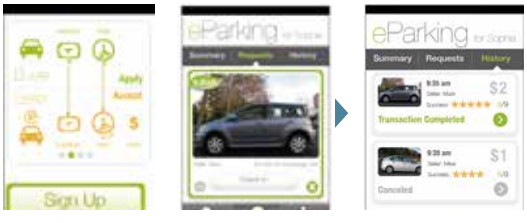
1 Selling parking spots

Customer registers the informaion including personal, car etc. Database manages the trading between the customer and buyer.

2 Purchase of parking spots

Buyer who wish to purchase a parking spot search for and select the appropriate spot and send their information.

3 The final deal is made.



The buyer who wish to sell a parking spot receives the information and final deal is made.

UC-win/Road Vehicle trajectory/ Parking lot CAD Automatic parking system

The vehicle trajectory drawing/ Parking design/ Automatic parking system

Proposal System

3DVR simulation is achieved by using the drawing information and by linking the creation of the trajectory mapping and the creation and design of the parking lot with UC-win/Road. In addition, an automatic parking system is available through the synchronizing of the VR model and RoboCar®.

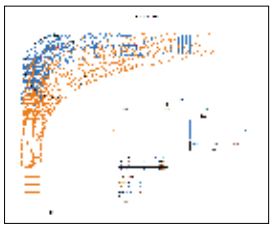
Vehicle trajectory drawing system Ver.3 UpGrade

Program Price：US$1,730

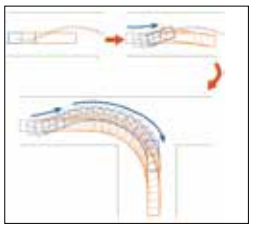
This allows the user to calculate and draw the trajectory of vehicles based on the figurative theories of "Style of right angle turning trajectory drawing of semi-trailer and full-trailer (JASO Z006-92), Society of automotive engineers of JAPAN, INC." etc. Driving simulation on visualized routes and existing routes and drawing vehicle trajectory and detailed vehicle shape can be conducted efficiently.

■The correspondence car type

▲Setting of registration of trajectory and vehicle



▲Drawing check screen (Trajectory drawing for application)



▲Trajectory check of a semi trailer moving back

Linkage with UC-win/Road

The trajectory can be represented in a 3D simulation by creating OpenMicroSim file and then reading it by UC-win/Road.

■ Parallel parking

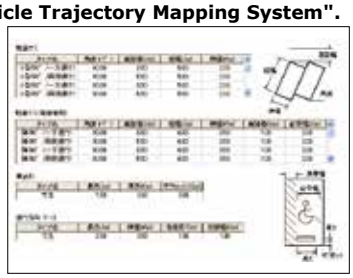
■ Combination driving

Parking Drawing System

Program Price：US$1,430

This is a CAD system which designs parking lots based on the parking standards with the figurative theories of "Standard Parking Regulations", "Road Design Standards" etc. (Drawing plan view). It allows the user to export the constructed parking drawing to CAD data which can be used in our "Vehicle Trajectory Mapping System".

▲The arrangement of the parking boxes after drawing circumference and route.



▲Setting the size of parking boxes

▲Result of linkage with vehicle trajectory drawing system

▲Reading and visualizing the parking lot model in UC-win/Road.

UC-win/Road RoboCar® Auto parking plugin

Proposal System

This system allows for the automatic operation of a steering wheel at the time of parking based on the information from a camera or ultrasonic sensor by linkage between UC-win/Road and RoboCar®. Parking can be conducted automatically by the driver simply pressing the button outside the car.

Automatic Parking System by RoboCar®

■Synchronizing with the model of UC-win/Road the scene of automatic parking can be checked in VR.

■You can automatically park the RoboCar® into the specified parking space or do parallel parking

■UC-win/Road easily enables the creation of a virtual parking lot.

■The view point can be changed so that the scene of automatic parking can be verified from a variety of positions.

■Path searching and decision by AI: Artificial Intelligence

-Route is corrected immediately when there is a gap in path

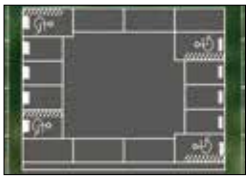
-Effective route is selected from the several route options available

-It allows the user to avoid obstacles 'en route' and search a new route at the same time.

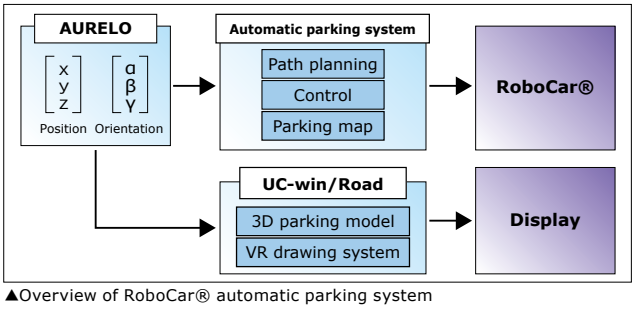
■RoboCar®'s position and orientation is based on AURELO (Augmented reality localization system) and the parking objective point is based on the parking map which has an automatic parking system.

Development plan

■A control system will be added into RoboCar®. In addition to obtaining information from AURELO, (search the path and decide), a more realistic automatic parking system will be developed which will enable the user to search for the parking space independently.



▲The scene of parking can be checked from any position.



▲Overview of RoboCar® automatic parking system

▲Automatic parking scene checked on UC-win/Road

FORUM8 Robotics

Integrated car robotics platform and virtual reality

UC-win/Road for RoboCar®

"RoboCar®" is a registered trade mark of ZMP Inc.

Fusion of car robotics platform and virtual reality

RoboCar® & RoboCar® SDK 2010 : US$8,000
RoboCar® & RoboCar® SDK 2010 Professional Package : US$8,500
UC-win/Road for RoboCar® Plug-in Option : US$3,360

■Combination of UC-win/Road and RoboCar®

In UC-win/Road, detailed representation of 3D space with a wide variety of traffic situations and scenarios can be achieved, and users can drive in this 3D space freely, and RoboCar® is a 1/10 scale model of real car that can be driven around in physical reality. With the combination of these two products, simulation in multiple realities can be made possible for tests that cannot be carried out in virtual reality.

■Various driving environments, interaction, and scenarios

Various driving environments including weather or road surface condition, interaction with oncoming vehicle and pedestrians, and the scenarios can be set. The back driving is also supported.

■UC-win/Road for RoboCar®Ver.2 for AURELO

3D localization function with AR position-fixing system

- Incremental encoders mounted on each wheel and the main motor to estimate the position and orientation of the RoboCar®.
- Laser Range finder, Infrared sensors and Stereo cameras to estimate the distance to the closest obstacles and identify known patterns for autonomous navigation.
- Wireless LAN adapter to allow a remote access to the RoboCar® from a distant PC.
- Accelerometer, Gyro ・Temperature sensorsC

■Proposal system

Driving simulation with 6 axis motion sensor

The driving can be performed in UC-win/Road by using 6 axis motion sensor of iPhone. The RoboCar®. can be operated by iPhone with the linkage to UC-win/Road. The steering is operated by rotating iPhone, and the operation of acceleration and brake is performed by touching the buttons in the screen.

Mind&VR UC-win/Road for MindSet

Linkage of Mindset Unit which measures the brain activity with VR

Investigation on Handless Control

MindSet from NeuroSky is basically a Bluetooth headset with the ability to measure the brain activity (EEG). Three electrodes on the left ear headphone and one electrode on the user's forehead allows the device to record a the raw EEG signal characterizing the brain activity of the user. From the analysis of the raw EEG signal, the components of the signal can be extracted (Alpha wave, Beta wave, Gamma wave, Delta Wave, Theta wave), as well as two parameters, the Meditation factor and the Attention factor. The mediation factor increases when the user relaxes while the Attention factor increases when the user focuses his mind on a specific thought.

Application: F1 race

Our first application using EEG based technology is a Formula 1 race. For this purpose, we developed an interface that allows to read two MindSet units, in real time (@60Hz) , with extraction of the Meditation and Attention factors. The F1 race takes place on the Phoenix street circuit in Arizona, US. The interface was implemented as a server so the two players can race on separate machines.The acceleration of the car is controlled by the Attention parameter, the more the user can focus his thoughts, the faster the car is moving. FORUM8 proposes the research system using biological information of brain wave.

▲MindSet Unit (Neurosky)

▲"Brainwave Vizualizer"(Neurosky)

▲Phoenix F1 Circuit

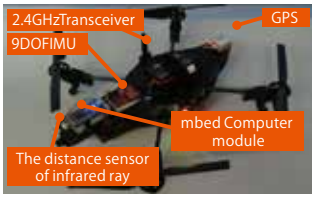
▲Popular as the exhibition system for its game element

AGUL AR.Drone

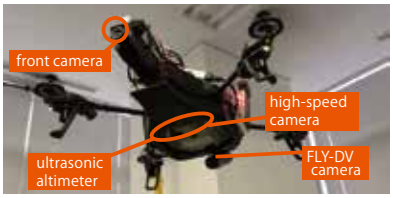
Remote farmland management project using AR.Drone customization system

AGUL is a system developed by customizing AR. Drone(Parrot) with a purpose of agricultual support. AGUL confirms the growth situation of crops and pests and supports the management of the farmland by collecting the information from the sky with a camera, temperature sensor and humidity sensor. Since the surrounding image can be transmitted from the mounted camera in real time, AGUL can avoid the obstacle and can be operated from the distant place such as a home.

■Communication with the frone is acheived via WiFi
■Since built-in computer controls the balance automatically
■Confirming with a front camera and high-speed camera and recording the details with FLY-DV camera.
■GPS measures where the AR.Drone is.
■9DOF IMU confirms the direction of flying AR.Drone by measuring the rate of acceleration, gyro and earth's magnetism.
■The distance sensor of infrared ray avoids collision with obstacle by measuring the distance from the front.



▲AGUL customization

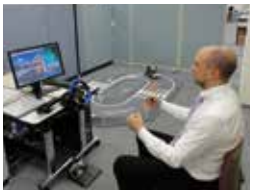


▲Test flight of AGUL

Kinect™ Driving Simulator

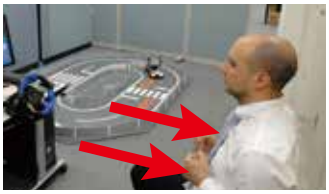
Handless driving simulation with infrared sensor

This system allows the operation of UC-win/Road by moving the arms as operating the steering in front of Kinect™. The positions of both arms which are detected by Kinect™ are converted into steering, acceleration, braking of vehicle.



•Neutral position
The operation of acceleration and braking is performed based on the distance from Kinect™ to the arms. It can be operated by moving backward and forward from the neutral position.

•Acceleration operation
It can be accelerated by moving the arms from the neutral position to the front. The further you move the arms, the larger the acceleration amount becomes.



•Braking operation
The braking operation is performed by moving the arms from the neutral position to the back. The further you

•Steering operation (Right-turning, Left-turning)
The steering can be operated same as actual steering control.
It supports for both of right-turning and left-turning.

UC-win/Road Air Driving application

It allows a highly-detailed driving operation without any control devices.

Recognition of skeleton
The system is able to recognize the user from the distance information detected by an infrared depth sensor and can distinguish human features. Moreover, it's calibrated and the skeleton structure is recognized.

Detection of steering angle and steering direction
The right and left direction of the steering wheel and its steering angle are detected as an analog value from the positional relationship between the user's right fist and left fist. How much the steering wheel is turned is indicated by a row of bars that change color from green to red. The bigger the steering angle, the more red the bar will be.

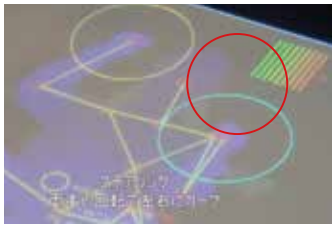
Distinguishing accelerator from brake
This is detected as an analog value from the amount of pressure the driver exerts on the accelerator pedal.

- Accelerator : The stack of bars will increase in the upward direction.
- Brake : The stack of bars will increase in the downward direction.

▲Infrared depth sensor

▲Pattern of infrared laser

▲Direct advance

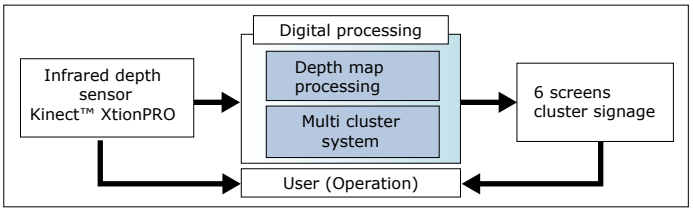


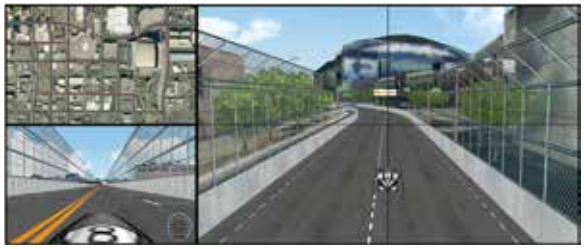
▲Right turn: As you steer to the right, the red bars will increase in that direction.

Multi-Cluster digital signage system with infrared depth sensor

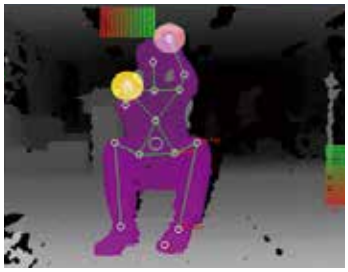
The interactive digital signage system uses a 6K display on multi screens as well as the infrared depth sensor.

This system can be interactively operated by using the function of gesture interface and motion capture. Xtion PRO is used for the infrared depth sensor. The signage is operated interactively compared to the previous digital display. We also provide this service and various products such as real time VR simulation using the multi cluster system and UC-win/Road, CG rendering using the supercomputer® etc.





▲6K Multi Cluster Digital Signage System
(UC-win/Road Network Multi Driver function)



▲6K Desital signage AirDriving(Tokyo Game Show2011、Left)
and AirDriving interface(right)

6K Multi Cluster Digital Signage System

■Hardware	US$54,080
■Software (UC-win/Road Advanced)	US$9,700
■6 cluster (Cluster plug-in / client)	US$19,860
■Setup cost	US$1,000
Fixed price	US$84,640
Total	**US$81,300**

Configuration of hardware : Ultra slim bezel with both ends 5.5mm, LED back light, 1920 x 1080 / 720cd, a set of stand, delivery costs (in Japan)
*VR model customizing and the additional system including AirDriving are separately sold.

Related service
High-performance computing on cloud service®
UC-win/ Road/ CG movie service

UC-win/Road for Robot Arm

A robot arm operates in conjunction with both virtual and actual space.

Using System Development Kit (SDK)

MR/AR System

MR: Mixed Reality
AR: Augmented Reality

Shibuya cloud model and interactive device

Mr. Taro Narahara (Graduate School in Harvard University, USA)

"Development of Linking System for VR and Interactive Devices"

Mr. Narahara mentioned a project in which he introduced actions captured from real people into motions of figures, and represented more realistic figures on UC-win/Road.

In addition, he explained the mechanism that enabled real-time interaction by linking simulation and UC-win/Road on a real time basis through joint development of plug-ins with FORUM8.

▼IVR exhibition 2010

▲The presentation in the 3rd International VR Symposium

3D Stereo System

Naked eye 3D Stereo System

Developed by : Ishikawa Kougaku Zoukei Laboratory Co.,Ltd. http://www.holoart.co.jp/

An example of system configuration

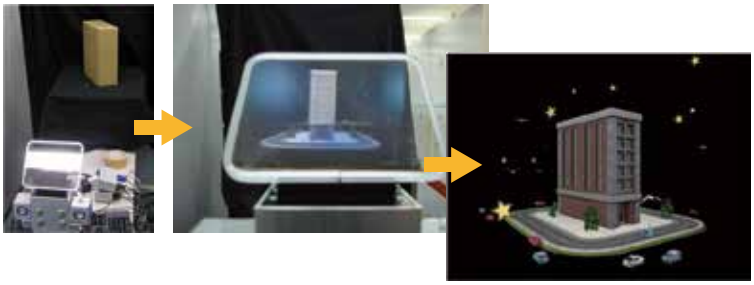
Glassless 3-dimensional image. Composition of a diorama and 3-dimensional image is displayed.

■What is 3D-B-Vision?

The 3D-B-Vision is a Mixed Reality, or more specifically, an Augmented Reality (AR) hardware system. AR is becoming more popular because of its function in projecting digital information over the real (physical) world. And with 3D-B-Vision, there is the added benefit of being able to project the digital information in the form of 3D-Stereoscopic CGI. The information can be displayed over architectural models or other physical objects.This glassless system is achieved by the use of two small projectors, placed eye-distance apart (for the 3D stereo capabilities). The participant looks through a transparent view window towards the physical object, and with the use of an overhead silver screen and lens filters, the 3D stereo image can be seen along with the physical setup. With UC-win/Road version 4, real-time simulation information can be projected. UC-win/Road 4 will include a 3D Stereo plug-in that can take full advantage of the capabilities of 3D-B-Vision. Cars, Pedestrians, and other moving elements can be shown acting together for an effective presentation with the 3D-B-Vision's stereoscopic projection.

■Benefits

- With UC-win/Road, real-time simulation information can be used with 3D Stereo
- Does not require polarized glasses. Promote new discussions for projects. Depending on physical model size, many can be used as 'kiosks' with varying information (strong visual impact with moving data)



HMD System NEW

Head Mounted Display System

Developed by : Oculus (USA) http://www.oculusvr.com/

3D images output via Oculus Rift

Provides head tracking and Ultra Wide Field of View 3D stereoscopic image with the built-in sensor that uses custom tracking technology.

■What is Oculus Rift?

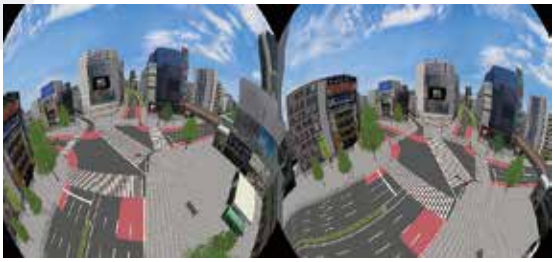
The Oculus Rift is a Head Mounted Display (HMD) designed for immersive gaming with built-in sensor that uses custom tracking technology to provide its users an ultra-low latency 360° head tracking and Ultra Wide Field of View 3D stereoscopic image at an affordable price.

■Display

Oculus Rift has an overwhelming breadth of vision as HMD. This is due to fish-eye rendering screen and because it seems the hemispherical projection screen is in front by the lens when they are worn. By combining the right-and-left stereoscopic parallax, a sense of immersion into the 3D environment is further improved. The conventional HMD minimized the distortion of lens by costing a lot to an optical system and display the normal images, whereas Oculus Rift is rendering the source images so that they seem to be normal through the distorted lens.

■UC-win/Road Oculus Plugin

Oculus Plug-in enables to track the camera view within UC-win/Road in line with the user's head movement using the sensor data. It is also possible to set the distortion correction of images according to the lens.



▲Fish-eye rendering

▲Stereo view of Oculus Plug-in

UC-win/Road Physical Model and VR System

Simulation / presentation system in combination with physical model and VR

"UC-win/Road Physical Model and VR System" was developed based on the idea and cooperation of Associate Professor Tomohiro Fukuda of Osaka University. Thanks to the technology of providing a combined operation environment of physical model and VR system, it is a new type simulation/presentation tool combing the features of both environments.The system allows you to present information effectively and efficiently to the people concerned with different background and varying knowledge levels.

Technical Support : Associate Professor Tomohiro Fukuda, Graduate School of Engineering, Osaka Univeristy

■Tool for examination with advantages of both physical and VR model

Advantage of VR:VR is highly flexible and expressive, and allows various considerations such as reproduction of traffic flow or changed weather conditions, which is impossible through a physical model.

Advantage of physical model:Physical model is more intuitive way to understand the overview of planning including the distance and size. Physical model allows various people to examine from the arbitrary viewpoints at the same time, understanding the whole city model simultaneously and touching the model directly.

■Deciding the viewpoint under consideration in a physical model and displaying it in a VR model

The planning can be studied by easy and intuitive operation in comparison with VR only. In "UC-win/Road Physical Model and VR System", you can move in the VR space and make changes in the view direction by indicating the view points to examine with laser pointer on the model.
The system consists of model, web camera, laser pointer, VR software "UC-win/Road", and display unit to view the VR display space. As a whole, the system consists of two functions: detecting laser pointer operation, passing detected information to UC-win/Road and representing it in VR space.

■Proposal and quotation of system

FORUM8 will offer the proposal and quotation of "UC-win/Road support system" based on the requirements of each customer. With UC-win/Road Support system, 3D VR simulation data can be created based on their needs. The created VR data can be modeled by exporting VR data to the physical model using 3D printer in a short time with "3D physical model service" so that the physical modeled VR system can be effectively structured.
Since the created data can be produced as a 3D physical model by "3D modeling service", customers can create Physical Model and VR Sytstem effectively.

Quotation example: "Nakameguro Safety and Security Map" Physical model VR system

The proposal system with the physical model in Nakameguro where FORUM8 is located. The maintenance condition of infrastructure in the basement and the inside space of building can be checked as "Area safety and security map" where the physical model and VR are integrated, and it can be used for the consensus formation in the city re-development project.

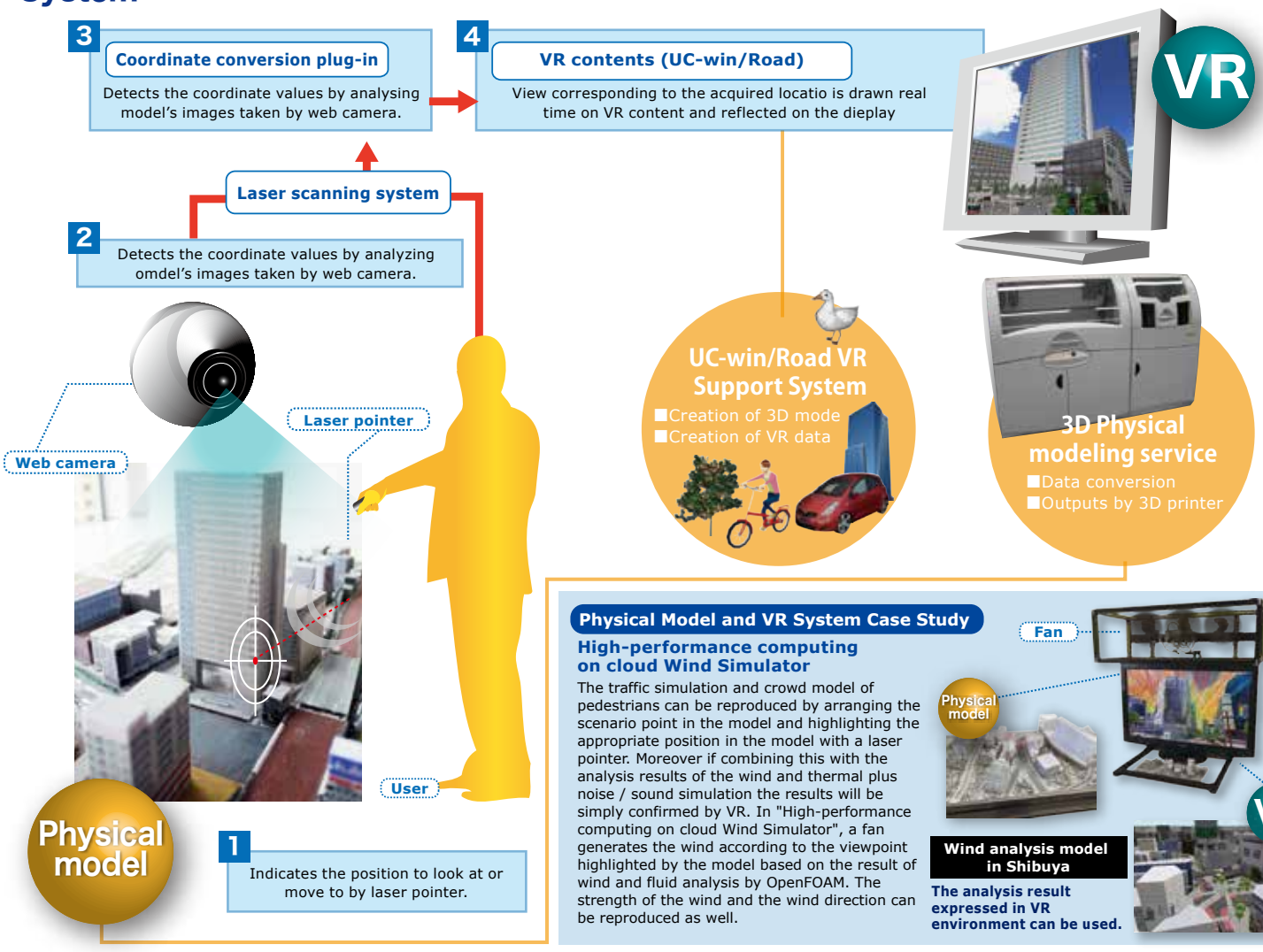
VR data creation : About US$27,000
3D physical model creation : About US$3,600,000
*Including the cost of ARToolKit license, Web camera, laser poiter, desktop computer, 42inch display, UC-win/Road Ver.5 Advanced x1 license, customization charge of UC-win/Road, and technical fee
Total: **US$116,000**


▲"Nakameguro safety and security map" Overview of VR model


▲The area in front of Nakameguro station


▲Meguro Ginza Shopping Avenue

System



Physical Model and VR System Case Study

High-performance computing on cloud Wind Simulator

The traffic simulation and crowd model of pedestrians can be reproduced by arranging the scenario point in the model and highlighting the appropriate position in the model with a laser pointer. Moreover if combining this with the analysis results of the wind and thermal plus noise / sound simulation the results will be simply confirmed by VR. In "High-performance computing on cloud Wind Simulator", a fan generates the wind according to the viewpoint highlighted by the model based on the result of wind and fluid analysis by OpenFOAM. The strength of the wind and the wind direction can be reproduced as well.

Wind analysis model in Shibuya

The analysis result expressed in VR environment can be used.

UC-win/Road Support System

VR/CG data generation and technical support service using UC-win/Road

Service overview

Supporting advanced, complicated, and cumbersome processing !

The service undertakes data generation tasks concerning UC-win/Road such as the generation of 3-D VR simulation data, 3-D models, and textures, fully empowering simulation tasks of road businesses, urban development planning, public projects, private developments, and so forth, using cost-affordable, high-quality data. The dynamic 3-D CG simulation is a powerful presentation tool. This is why there have been so many achievements, awards and public recognition received since the service commenced in October 2001.

VR Modeling

Supporting line-shape/ cross-section definition, diverse configuration settings, AVI output, and so on

Data generation of UC-win/Road and VR/CG caters to all needs and is based on a range of simulation examples. Materials such as general diagrams and line-shape calculation sheets, inputs, editing of landforms, definition of line-shapes / cross-sections, appropriate arrangement configuration and the output processing of 3-D models and textures.

3D Model／Texture

Existing and new creations of standard 3D model/ textures are supported.

A new creation of a 3D model and the texture installed as a default is supported as well as custom edits. Our staff will support you to help create the 3D model, texture, and the Road data creation for real-time VR presentation by UC-win/Road.

Fully supporting data generation. Users take the leading role in their presentations.

Presentation

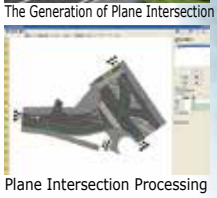
UC-win/Road package presentation version

This visual tool allows engineers to control and give explanations by themselves. Presenters can explain and make changes using real-time VR and display options which offer a variety of visual representations. These features are also available in the presentation version, allowing redistribution of the program to clients.


The Generation of Plane Intersection


Interchange


VR simulation of City


Plane Intersection Processing


The Generation of the On/Off lamp


Roller Coaster model


F1 Course simulator


Construction simulation


Sunshine simulation

Sample models of estimation example

FORUM8 Standard estimation system

Web Estimate Service ▶▶▶ https://www2.forum8.co.jp/road_estimate/html/main.htm

1.Kushimoto Bridge/ Myouga Loop Bridge Simulation

Kushimoto Bridge and Myouga Loop Bridge (1.6km) to link Oshima with Kushimoto-cho, southernmost end of Honshu and road data model (0.3km) in Oshima. Kushimoto Bridge designed by Osaka office of Nippon Koei Co., Ltd. won the Tanaka Prize of Japan Society of Civil Engineering in 1999. This sample data is used as proposal of bridge preliminary design.

Total extended distance (A) 2.985	Man-day (B) 3.850
Option work Man-day (C) 8.200	
Aerial photographs US$672	Total US$11,300

2.Condominium Project VR simulation

The neighborhood of Nakameguro Station, Meguro-ward is expressed. GT tower where locates, roads, and urban space around Nakameguro Station are created. Newly built condominiums (fictitious) along Komazawa Avenue are modeled, assuming the confirmation of interior / exterior scene. Traffic flow, railway vehicles and person model are expressed. Fake light textures during night and motion control models are set, too.

Total extended distance (A) 7.087	Man-day (B) 4.350
Option work Man-day (C) 26.400	
Aerial photographs,Coverage US$1.302	Total US$32,000

3.VR simulation for landscape evaluation for urban planning

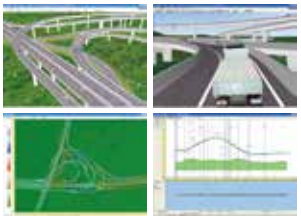
Material for landscape evaluation of urban planning. 5m mesh is used for terrain. A planning road and new transportation system are created. Structures of planning area and distant view of the landmark created and the structures in an adjacent area are imported from IFC. Switching before / after designing the proposed plan, special weather, context design for switching the landscape. One of the scenario for driving on the planned road is set.

Total extended distance (A) 6.086	Man-day (B) 4.350
Option work Man-day (C) 14.000	
Aerial photographs,Coverage US$1.053	Total US$18,500

4.VR simulation of crossing in an urban area

Urban area with a central focus on a huge crossing is expressed. Two of roads, crossing and tunnel section are created. Importing point clouds and comparing its data with VR data are possible. Parking lots are placed and the important buildings are expressed in detail via FBX. Placing trees, lightings etc. and expressing the spread of smoke due to an accident. Pedestrians in the surrounding area are walking due to the crowd function.

Total extended distance (A) 10.230	Man-day (B) 3.650
Option work Man-day (C) 6.000	
Aerial photographs -	Total US$12,200



5.Land Development / Readjustment VR simulation

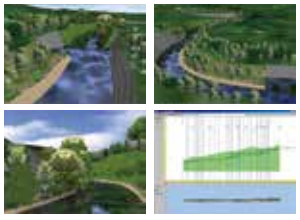
This is created for by-pass examination plan in developed land of a town. This data is used for the scene examination from developed land after by-pass completion, the check of the difference in height between lands, the access road check from the by-pass to the land and examination of car stop installation. It allows checking scenes from arranged standard building models in developed land.

Total extended distance (A) 1.856	Man-day (B) 3.650
Option work Man-day (C) 4.000	
Aerial photographs -	Total US$6,700

6.River Development VR simulation

This is around 600meters of river development data. This is created to match with nature as a concept image. Trees are planted in river and revetment which is displayed by a revetment block and partly and a natural revetment. The function of lakes and marshes are used.

Total extended distance (A) 0.840	Man-day (B) 4.650
Option work Man-day (C) 4.800	
Aerial photographs -	Total US$5,300



7.Mountain Road VR simulation data

This is 2.23km of mountain road data. 1 tunnel and 1 bridge are set in the section. As to creation area, detailed current terrain is displayed, by creating the terrain patch data corresponding 1 meter mesh from terrain contour data (DXF). Cut slope / embankment in each side of road, such as berm are reproduced faithfully.

Total extended distance (A) 2.512	Man-day (B) 5.350 Option
work Man-day (C) 3.700	
Aerial photographs -	Total US$10,300

8.Grade Intersection VR simulation

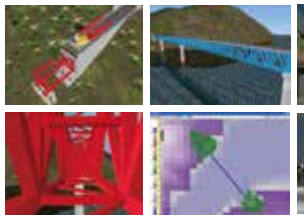
This is normal grade intersection data. Road extension is 700m. Building models registered in D.B are arranged in wayside. Pedestrian bridges and sidewalks on the road, street lights and trees on planting zone are arranged. Traffic flow and intersection driving route are set.

Total extended distance (A) 0.910	Man-day (B) 3.850
Option work Man-day (C) 3.600	
Aerial photographs US$672	Total US$27,400

9.Bridge Erection VR simulation data

The data express the bridge erection steps of 560m of road across mountains and a ravine. All erection steps can be seen for the setting of movable models. Synchronizing truss erection with crane action provides the clear erection images and setting of road alignment provides driving images after construction complete.

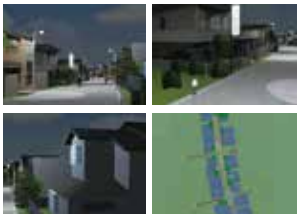
Total extended distance (A) 1.164	Man-day (B) 3.850
Option work Man-day (C) 9.600	
Aerial photographs -	Total US$8,200



10. Lighting simiulation in housing complex

This is the data illustrating night time street lights simulation in the housing complex. A 200m stretch of the street is created and the town block, detached houses, plants, and the street lights are set. The lighting function is set for the 10 positioned street lights and the bloom function is set for the internal lighting signs, foot lights, and window of the house. The route is set in the street and the walking human model is assigned. The script is also set.

Total extended distance (A) 0.425	Man-day (B) 3.650
Option work Man-day (C) 6.400	
Aerial photographs -	Total US$4,100



11.Estimates for Construction Cost VR simulation data

100 meters of construction zone within around 500 meters of road extend distance, and traffic lane regulation related with it, including traffic lights and signals controlling are expressed. Construction zone is displayed by arranging models with scene switching. There are 3 phases of scene switching, including current state.

Total extended distance (A) 0.690	Man-day (B) 3.650
Option work Man-day (C) 7.750	
Aerial photographs -	Total US$5,800

Estimated Price	
Direct personnel costs	[(Estimated distance A) * Work unit (per km) B + Option work unit C] * Engineer work unit cost D
Administrative costs	Direct personnel costs ×50%
General costs	Technical costs (Field survey cost etc.), Express charges (25% extra charge for overtime working etc.), software/hardware purchase costs, Apparatus rental/ transportation, Satellite photography costs, Transportation costs (actual cost), Work management costs

Approximate Estimate

<Approximate Estimate per 1Km>
1. Standard cross-sectin, Low precision, Not subject to treat details of terrain, No extra work
= About US$1,100
2. Bridge, On/Off lamp cross-section, Standard precision, Not subject to treat details of terrain, No extra work
= About US$1,900


▲Medium Resolution


▲High Resolution A

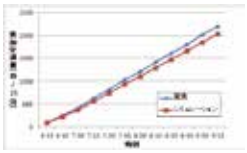
3DVR simulation service

Traffic Analysis VR Service

Traffic analysis service by a traffic simulator and VR model creation service

Traffic Analysis VR Service is a service that utilizes traffic analysis tool such as traffic simulation model for its analysis and creates VR model fit for the traffic simulation model in UC-win/Road.

▼Compared image of calculation result



■Concept

By integrating traffic simulation with the whole 3D visual interactive simulation within 3D virtual environment, various applications of the software that was somewhat challenging become feasible. This service will guide you through the entire process of traffic analysis and simulation.

▼Representation of traffic condition on UC-win/Road

■Traffic Simulator

Traffic simulators that are used for the analysis are the 3 listed below. Aimsun creates VR model fit for the simulator, imports traffic behavior as calculation result and reproduces the traffic in VR space.

■Service

Traffic analysis and VR service in our all-in-one service in which we verify what you wish to analyze and visualize, determine the kind of data required, and upon reception of the data from you, create traffic simulation models, 3D VR models, and analysis report based on the data.

▼OSCADY

▼TRANSYT

▼Aimsun（3D表示）

•Analyzed content and the data required

Upon confirming the objective of your desired analysis, we will verify the kind of output required and the kind of data we would like you to prepare.

Example of analysis content

- Provision of traffic jam
- Studies on analysis for traffic accident
- Studies on traffic influence associated with the road construction
- Studies on traffic influence associated with the site location such as commerce facility etc.
- Consensus formation in a workshop

Example of output

- Traffic simulation model data
- Analysis report
- UC-win/Road VR data
- Animation movie

Example of data for model creation

- Result of traffic analysis
- Result of assigned traffic
- Drawing for design etc.
- Site photograph etc.

•Creation of traffic simulation model

We will choose a simulator best suited for your objective and then create traffic simulation models. Basically we will create traffic simulation models that reproduces the real traffic flow, confirm the accuracy of reproduction, change various conditions of traffic and predict the traffic flow under different conditions.

Reproduce traffic flow: Based on drawings, onsite pictures, and the results of traffic investigation, we will create a road network model, input traffic demand, and assign signal phase. Then the traffic simulator does the calculations to acquire the traffic volume, queue, and time required to drive through traffic so that we can compare these with those of the real traffic to confirm how accurate they are reproduced. If there's room for improvement in terms of accuracy, we will adjust the parameters of vehicle behavior for improvement.

Create/calculate prediction model: Based on the traffic simulation model created for the purpose reproducing traffic conditions, we will create a prediction model by changing parameters around to find out how traffic flow changes as a result (For example, changing the number of lanes, traffic demand, signal phase, etc.). Then we will let the traffic simulator do the calculations and once the result comes out, we will sort it out.

•Reporting the analysis result

The following analysis result can be output as a report in order to apply the calculation result obtained from traffic simulation.

Adjust analysis conditions: Prior to running the simulation, various conditions such as road network, traffic demand, signal phase, etc. can be adjusted by changing each of their parameter.

Examine the accuracy of reproduced traffic flow: Result of calculation based on the traffic simulation model created for the purpose reproducing traffic conditions can be compared with the observation result (such as traffic investigation result) In order to examine how accurate the traffic flow is reproduced.

Arrange the prediction results: The result of calculation performed on the traffic simulation model designed to reproduce traffic conditions and on the prediction model are arranged.

•Create VR model

We will create a VR model in which the result of calculation based on the traffic simulator can be visualized using UC-win/Road. In order to visualize traffic conditions, a model in which vehicles' behavior in traffic can be simulated by utilizing UC-win/Road's Micro Simulation Player feature.
It is even possible to drive through a simulated traffic by interfacing UC-win/Road with the driving simulator.

VR City Modeling System

Facilitator: Hiroo Kasagi (Representative of NPO Chiikizukuri Kob and Japan Society for Impact Assessment)

Interactive city modeling, a popularized city modeling method that incorporates VR

We will propose VR City Modeling System as part of the consulting service within the municipality solution.

■Case study: Modeling a safe and secure city

In this case study, the vicinity of Nakameguro station where office buildings, shopping streets, and residential area coexist are visualized to evaluate its safety. In the first stage of the project, town watching was conducted and based on the observations, a map of the area was created. In stage two, we have visualized the map including its information on 3D VR space and held a workshop for residents and those affected by the safety issue of the town to explain the usage. For example, a junction that is considered dangerous can have its safety evaluated by reproducing actual traffic volume on VR space and running traffic simulation. Moreover, places that give residents the creeps at night can have their safety evaluated by changing the time of their virtual counterpart from day to night. Furthermore, by incorporating administrative information such as a hazard map to the VR city model, even potential risks that you usually are not aware of such as the risk of flood due to severe rainfall can be visualized for risk assessment in order to make residents understand the risks and come up with measures.
By doing analog work (workshop) on digital processing (VR), we were able to design the whole process of obtaining stakeholder consensus in a very intuitive and effective way. In this case study, facilitator who specializes in this kind of workshop and FORUM8, a software-house that specializes in 3D VR technology, teamed up to manage and run this really effective process of city modeling and consensus building.

▲Verification of a plan and consensus formation using VR-Cloud®

▲Check the safety in Nakameguro

Example program of modeling a safe and secure city

※Assumption ・Host Government or modeling conference, public association such as NPO
・Participants About 20 people of citizen and operator establishing new business facilities
・Area within 200m radius of community association and shopping avenue

Schedule	Content	Facilitator	VR engineers
Meeting	Setting of participants, Understanding the task before hand, Confirming a program, Discuss how to make use of the output	1	1
Preliminary work	Preview the spot, Collect related information, Arrange required equipment and supplies etc.	1	1
	Create the basic VR data	0	10
The first WS	Town watching, Create a map, Exchange the observation outcome, Discuss the task	1	1
Add-up	Make a report of WS, Consider how to visualize, Consider how to carry out the second WS	1	1
	Visualization	0	2
Preliminary work	Confirm visualization, Confirm how to carry out WS, Arrange required equipment and supplies etc.	1	1
The second WS	Exchange simulated experience and feedback using VR, Consider the application of the observation outcome	1	1
Add-up	Make a report of WS, Examine the method of visualization, Share the image of observation outcome, Suggest the utilization method	1	1
	Visualization	0	2
Application	Presentation, Publication on Web (if required)	(1)	(1)
	Total	7man day	21man day

※The amount of VR modeling work and the number of facilitators required may vary according to the number of people involved in the discussion and the area in question.

VR data by UC-win/Road ("Nakameguro Safety Map")

Feature of Nakameguro seen from Bird's-eye-view

Danger of the traffic under the railing

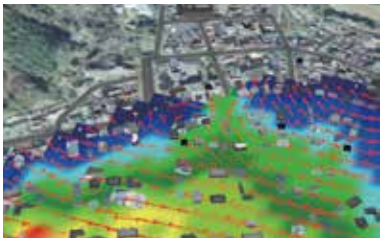
Risk of flood in the basement shops

3DVR simulation service

xpswmm flood and tsunami analysis VR simulation service

The tsunami analysis by difference method of shallow water theory

Tsunami representation function by real time virtual reality UC-win/Road. Tsunami generation by xpswmm cooperation and setting of tsunami position, range, and height by visual option is possible. Predicting the land flood range and the flood depth of the tsunami that could occur in the future by the difference method of shallow water theory. Wave power evaluation to a structure and flotsam transportation, calculation of wave height and speed of each mesh point, creation of tsunami height distribution map. We propose a model cooperating with the research of the tsunami engineering laboratory of Tohoku University (professor Fumihiko Imamura).



Tsunami analysis example

As for the numerical calculation of tsunami in the Imamura laboratory, the difference method of the shalow water theory is used. Tsunami analysis performs run-up simulation that predicts the land flood range and the flood depth of the tsunami that could occur in the future. By this calculation, the evaluation of wave power to a structure and transportation of flotsam, and by calculating wave height and speed of each mesh point, tsunami height distribution map is created. Furthermore, as for the submarine topography information, there are documents open to the public from the Marine Safety Agency.

Input conditions

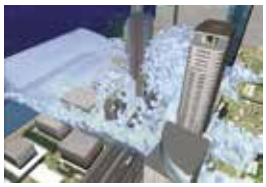
As for conditions to enter, there are hypocenter information (magnitude, hypocenter depth, position), submarine topography data (height above sea level and position), terrain information, and etc.

Analysis result example

We will introduce one example of the calculation results of the Fukushima earthquake that occured on July 19th, 2008.

The scale of the earthquake was,
M=6.6, hypocenter depth of about 10km

In this research result, although the result is about 20 minutes delayed from the expected arrival time of the Japan Meteorological Agency, it is mentioned that the result almost matched the observation result.



▲Tsunami simulation (smoothed-particle hydrodynamics analysis result use proposal model)

▲Maximum tsunami height distribution example

Tsunami numerical analysis support service

By using the tsunami analysis code developed by Imamura laboratory, carrying out creation of hazard maps, analysis support service applicable to evacuation estimation concerning tsunamis, and cooperation with UC-win/Road is possible. By taking in the basic information of terrain, buildings, and trees, etc. of UC-win/Road in cooperation with the Road data, labor saving of input is expected. Also, UC-win/Road takes in the calculation result of the analysis code and vizualise it.

Input condition

Hypocenter information, submarine topography data, and terrain information

Analysis result example

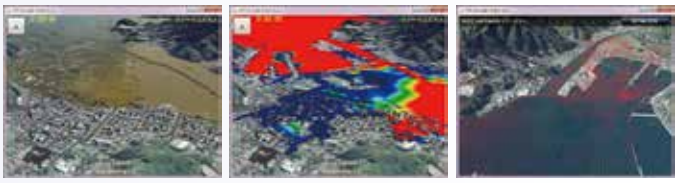
Caluculation result of the Fukushima earthquake on July 19th, 2008. Almost matches the observation result.

Tsunami numerical analysis support service

<Kamaishi city Iwate, tsunami analysis data creation>

Analysis category: Tsunami analysis by two dimensional shallow water flow model
Node number: 0 It does not take into account the drainage infrastructure and it does not carry out a 1D analysis
The size of the catchment area (ha): 700 The sea area and the land area
Analysis case number: 1 Present state breakwater scale simulation (no additional breakwater countermeasure)

Reference estimated price: JPY 1,840,000
VR data creation service: JPY 2,240,000



BCP simulator

Supporting disaster simulation and training of BCP (business continuity planning) construction and operation.

Create the shaking of earthquake and its impact in 3DVR, and uses for the situation explanation, response simulation, and BCP education at the time of disaster. Based on the scenario set, reproducing the situation within the company and the evacuation root when struck by a disaster, human resources and materials usable at each stage of the restoration, the office view during business continuity, the business state, exchange with customers, adn etc. in VR, and by utilizing in education and training, it helps accurate and smooth action at a time of emergency.

BCP scenario example (earthquake)

Disaster occurrence and evacuation start

Representation of shaking due to the earthquake occurrence and collapse of furniture

Damage situation check and restoration

Sharing of the damage situation in cloud by utilizing BCP support tool.
Check the progress of restoration and resume business

Evacuation route 1 (stairs)

Evacuation start. Representation of the movement of people in collaboration with the evaluation analysis EXODUS.

Evacuation route 2 (elevator model)

The simulation in a case of using the elevator,
by the evacuation analysis EXODUS elevator model function.

High-performance computing on cloud services

New service with the advanced calculation feature of high performance computing

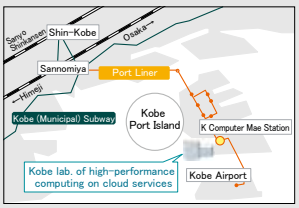
FORUM8 started a service that utilizes HPC (High-Performance Computing) and established "The Supercomputer Cloud Kobe Laboratory". This service offers new solutions such as large-scale analysis/simulation, CG rendering etc. through the use of high performance calculation capability that is unique to a supercomputer.

■ High Performance Computing Service on Cloud Services

FORUM8 has established "Kobe lab. of High-performance computing on cloud services in the "Advanced computational science support laboratory, Foundation for Computational Science(FOCUS)" constructed near the next generation super computer "K". We provides the service using supercomputer which supports for more than 22 Tera-FLOPS (22 trillion calculations per second). Moreover the software and service in which the environment of next-generation supercomputer "Kyo" which will be used for industrial from the fall of 2012 is proceeded to be researched and developed aiming its highly development.

FORUM8 Kobe lab. of high-performance computing on cloud services

■ Address :
FORUM8 Kobe lab. of high-performance computing on cloud services
Laboratory1, Computational science center building 2F, 7-1-28,
Minatoshima, minami-cho, chuo-ku,
Kobe city 650-0047
■ TEL : 078-304-4885
■ FAX : 078-304-4884
■ E-Mail : f8kobe@forum8.co.jp



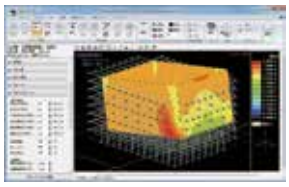
■Services that use a supercomputer

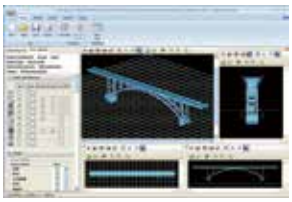
Engineer's Studio® cloud option

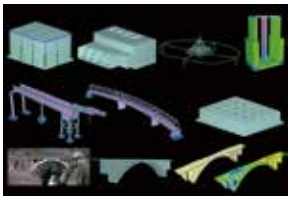
Engineer's Studio®, 3D FEM analysis program is in house development from pre-processing and calculation engine to post-processing. FOCUS high-performance computing. This allows the scale for analysis to be enlarged and the time taken for analysis to be reduced in Engineer's Studio®. In this service, the data is automatically linked with FOCUS high-performance computing by creating and registering them via the Internet. The final result data is scheduled to be taken via web application.　※1 FOCUS　http://www.j-focus.or.jp/

The analysis procedure

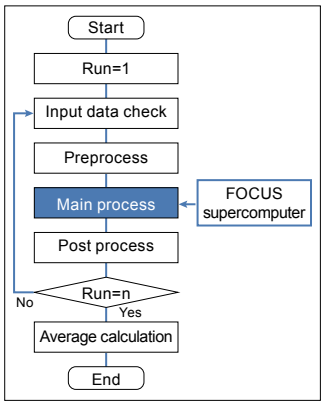
① Input data for analysis in Engineer's Studio
② Log onto the UC-1 for SaaS server
③ Upload data in question (and submit a command)
④ Download analysis result
⑤ Display analysis result and create its report using Engineer's Studio®







▲Example of a large-scale model (skyscraper: approx. 80,000 nodes)

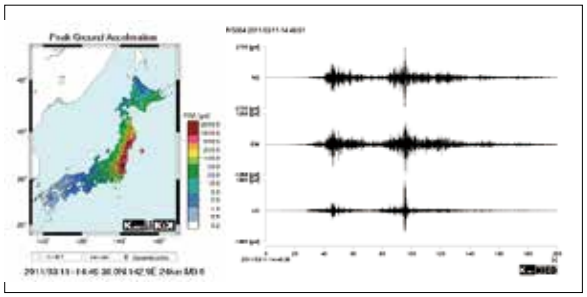


▲Process image of Engineer's Studio® analysis service

Supercomputing Analysis Support Service Option

This is an optional service similar to the conventional Engineer's Studio® analysis support service. Through the use of a Supercomputer, calculation time can be significantly reduced and the analysis accuracy can be improved. A great example is the analysis that was performed on the data measured at K-NET Tsukidate Observatory when the 2011 Tohoku earthquake struck, which was released by National Research Institute for Earth Science and Disaster Prevention Strong-motion Network, also known as K-NET. The supercomputer showed off its outstanding performance by analyzing the data in 300 seconds (rate of 30,000 steps per 1/100th of a second).

■Reference : National Research Institute for Earth Science and Disaster Prevention Strong-motion Network K-NET (http://www.k-net.bosai.go.jp/k-net/)



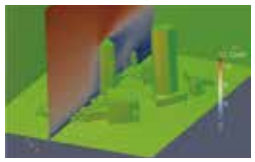
Wind and heat/fluid high-performance computing analysis simulation service

This service is the analysis and simulation support service with general-purpose fluid analysis tool "OpenFOAM". It allows to simulate the flow of complicated fluid including turbulence and heat transfer. In this service, many users who don't have the environment for usage can use the advanced analysis environment using a super computer by FORUM8's accessing to super computer.

■Case① Building complex in Shinjuku, subcenter of Tokyo

▲Mesh in Shinjuku, subcenter of Tokyo, and the distribution map of wind velocity (contour / vector)

■Case② Building complex of the vicinity of Nakameguro station



▲Mesh of the vicinity of Nakameguro station and the distribution map of wind velocity (contour / vector)

Take existing analysis to the next level.

・Wind analysis (wind analysis around buildings)
・Water (individual fluid at a fixed point fixed or fluid flow without boundaries)
・Analysis of multiphase fluid flow (air and liquid, liquid and solid etc.)

Estimated price for Shinjuku, subcenter of Tokyo	
Analytical area : 1700m×1700m×700m Node : About 750,000 Element : About 1,300,000 Analysis time : About 2 hours Work unit : 22.2	
Estimated price	US$ 13,466

Estimated price for Nakameguro model	
Analytical area : 400m×500m×300m Node : About 530,000 Element : About 950,000 Analysis time : About 1 hours Work unit : 12.2	
Estimated price	US$ 7,400

Base price	
Direct personnel costs	[Estimated area* Work unit* extra for shapes]* Engineer work unit cost
Administrative costs	Direct personnel costs * 80%
General costs	Technical costs, express charge

High-performance computing analysis simulation service on noise.

This service is for the simulation of noise production in general by locating the sound source and for receiving sound in VR space. The sound compression level on each point of receiving sound on the surface of receiving sound is analyzed considering the influence of ground, structure and construction. It works well especially on the large-sized data processing.

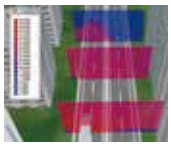
Procedure of noise analysis

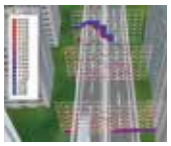
① **Preprocess**
- **Import geographical data and terrain data**
- **Define the structures including roads and bridges**
- **Define the constructions including buildings**
- **Define the sound source and sound receiving points**
- **Define the analysis conditions**

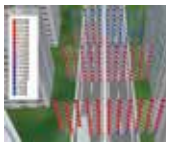

▲Mesh in Shinjuku, subcenter of Tokyo, and the distribution map of wind velocity (contour / vector)

② **Main process**
- **Analysis**
- **Output analysis result**

③ **Post-proces**
- **Import analyzed result**
- **Visualize the analysis results**


▲Visualization by contours


▲Visualization by contour lines


▲Visualization with sphere shapes

Noise measurement service (option)

This is a service in which noise level in construction sites and traffic zone is measured (arbitrarily) and the measurement result is provided to the customer. We can also model the area in question in VR space and import the measurement result together with the result of noise simulation analysis conducted by a supercomputer to the modeled environment to help you see the difference in noise level much easier.

High-performance computing analysis simulation service on noise

1. Interview about the outline of the request via telephone or e-mail
2. Explanation about quotation and work contents
3. ・VR modeling of the measured location
   ・Forecast analysis on noise in case of setting the sound source

Noise measurement service (option)

4. Noise measurement on a location
5. Creating the report for the measurement result
6. Delivery

■Construction noise case

Noise analysis condition	
Fixed noise source : 1 Sound receiving surface=80m×80m×2 surfaces Sound receiving point : 289 Sound source level : 112dB Analysis time interval : 0.01 seconds Actual time for analysis : 0.26 seconds	
Estimated price	US$ 827
Noise Measurement Condition (option)	
Station : 5 points (All is on the ground.) Measurement Time : 9 hours	
Estimated price	US$4,342

■Road noise case

Noise analysis condition	
Fixed noise source : 2 Sound receiving surface=100m×400m×2 surfaces Sound receiving point : 880 Sound source level : 100dB Analysis time interval : 0.02 seconds Actual time for analysis : 2.0 seconds	
Estimated price	US$469,940
Noise Measurement Condition (option)	
Station : 2 points (All is on the ground.) Measurement Time : 24 hours	
Estimated price	US$15,731

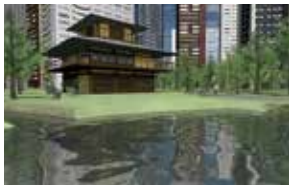
UC-win/Road CG movie service

This is a service in which high quality animation is created using POV-Ray script rendered by a supercomputer in frame units. POV-Ray script can be edited using an editor etc. once it is exported from UC-win/Road.

How the service runs:

①Create a scene in UC-win/Road
②Adjust the animation contents
③Create POV-Ray script
④Rendering POV-Ray script in frame units (using super computer)
⑤Create animation using the rendering result
⑥DeliveryHow the service runs

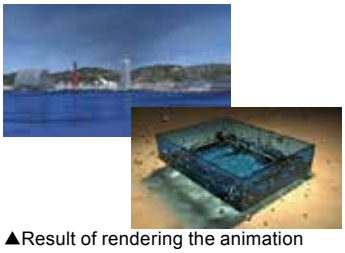




3ds Max / CG Rendering Service

This is a service providing photorealistic images often mistaken as photographs for their extremely detailed quality, which can be generated by performing an enormous calculation based on a real physical equation using high performance computing of FOCUS (Foundation for Computational Science). Besides the reviewing the design of an interior coordination of BIM models in architecture, the service is applicable for various other purposes such as planning automobiles and their components, reviewing a project at the design stage, presentations, public relations, and marketing.


▲Left:Image rendered in 1000 seconds by FOCUS Supercomputer performing parallel processing on 100 nodes.
Right:Example of LuxRender output.



▲Result of rendering the animation via "K".

FORUM8 has been granted the privilege to use the HPCI System for their R&D project in FY 2013, as a trial.
FORUM8 has been granted the privilege to use "K" as a HPCI System for industrial purpose in the course of their R&D project in FY 2014.

High-performance computing services planned ahead

■ 3DVR Cloud "VR-Cloud® Service

Under development

The linkage of cloud service and high-performance computing allows the calculation and transmission of large-scale data.

■ Ground Energy Simulation "GeoEnergy"

■ Tsunami and fluid analysis simulation service

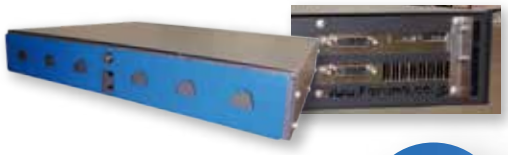
Large-scale and high speed Tsunami and fluid analysis service


Tsunami Analysis

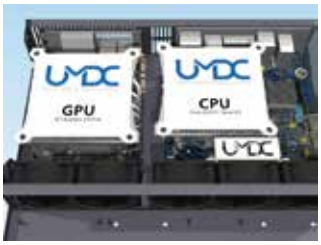
Ultra Micro Data Center

ウルトラマイクロデータセンター®
ultramicrodatacenter.com

Small, GPU-ready multipurpose server for any application from computational science to cloud gaming.



The Ultra Micro Data Center® project aims at solving those issues by proposing a new form factor for servers, which is much smaller and can fit any high end GPU card easily at an affordable cost.



Line-up

Small size
- 430(w)x64(h)x330(d), 9ℓ
- one-quarter of general 19 inch server

Quietness
- Quiet fan and temperature sensor are used.
- comfortable in an office and house

Environment-friendliness
- Energy-saving tip and solid state disk are used.
- Comsumed power 500W (High-performance)
  (Approximately half of general 19 inch)

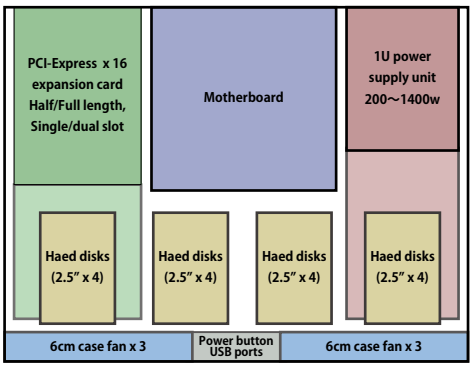
Wide variety of uses and its extensibility

CPU performance	Intel 3rd generation Core processors, Xeon E3/E5 AMD phenom II X6 processors Up to 64GB of memory
GPU performance	nVidia GeForce GTX Series 6xx, Tesla/Quadro/CUDA AMD Radeon HD Series 7xxx, FirePro
Storage	Up to 16 2.5 inch disks Maximum storage size: 32TB Maximum transfer speed up to 8Gb/s (read) Hardware RAID (levels 0, 1, 5, 6 and spans 10, 50, 60)
Multimedia	Video capture, encoding, processing and streaming Use of any high end CPU (see CPU performance version)

Design

The main issue with the design of 19 inch servers is the size. Those servers have a very long depth and small height, which makes it difficult to fit high end GPU cards. A lot of the space at the end of 19-inch enclosures is wasted because of the long depth while the small height makes it hard to properly cool system components or even fit dual slot GPU cards.

Back



Front

▲System configuration

Performance comparison table

	19 inch server (2U)	Ultra Micro Data Center®
Size(width x height x depth)	482 x 87.3 x 755 millimeters 19 x 3.4 x 29.7 inches	430 x 64 x 330 millimeters 16.9 x 2.6 x 13.4 inches
Volume	31.7 L	9.0 L
CPU	Xeon E5-2640 (2.5GHz, 6 cores)	Core i7 3770K or Xeon E3-1270V2(3.5Ghz, 4 cores)
Memory	4GB	16GB
GPU	nVidia Quadro 5000	Any PCI-Express gpu card (full lenght, dual slot supported ex: nVidia GeForce GTX 580/670/680, Quadro 5000/6000 ...)
Storage	100GB SSD	120GB SSD Option：120GB SSD x4 RAIDarray （max,480GB,read/write 2GB/s)
Network	Gigabit LAN x2	Gigabit LAN
Power supply and consumption	1100W	500W
Supported operating system (not included in price)	Windows Server 2008/2011 Red Hat Linux	Windows 7／Windows 2008/2011／ Red Hat Linux／Fedora Linux （Can be sold without OS）
Approximative retail price	US$10,000	US$5,000

Kobe lab. and factory of high-performance computing on cloud services was open. HPCI system utilization research theme "Kei" field adoption!

This factory will be used for research development and production of small, GPU-ready multipurpose server for any application from computational science to cloud gaming "UMDC Ultra Micro Data Center @".

Medical VR System

Solution in a hospital and medical front using 3DVR

Various types of Driving Simulators that uses the interactive 3D VR (virtual reality) software. Various analysis services including diagnosing the ability to withstand earthquake in buildings, analyzing energies in buildings, fire and evacuation analysis, etc.
We will provide our FORUM8 branded software, system and services.

VR in a hospital and medical front

Use of VR in a medical front

Construction plan for a hospital and medical facility
Various kinds of simulation

3D virtual reality UC-win/Road

Seismic diagnosis
Energy analysis in a building

3D／VR
Use of cloud

Introduction and its purpose of VR

For medical staff	For patience and local residents	For architectural designer	For hospital managers
■Improvement of medical front Review the arrangement of medical equipments Simulation of reheating cart Verification of a passage width etc. Verification of the layout of the hospital room and doctor's office Verification of the scenery from a hospital room window Simulation of rehabilitation	■Communication with local community Verification of the site locatioin Verification of the image inside a hospital Visualizing via 3D model Communication via cloud computing and VR technology	■Share new design concept with staffs and hear their requests Energy saving and environment-friendliness Share new design concept with staffs Hearing the requests from staff Improvement of the accuracy of estimates for the consumption energy Seismic diagnosis	■Secure the clear materials to make some decisions and risk management strategy Verification of the architectural vision outside and inside of the hospital Earthquake disaster prevention Evacuation analysis Avoidance of the damaged road for emergency vehicles

● Verification of the layout and arrangement of medical equipments inside a hospital

Interior layout of the hospital is critical factor for improving work efficiency of hospital staffs. The use of VR simulation can visually pinpoint problems of the current layout and send a clear message calling for plans of better design.

■Review and confirm the image of the hospital's interior

VR simulation was applied to rehabilitation in order to review the rehabilitation procedure and to keep track of the patient's improvement.

■Review the arrangement of medical equipments

Conceptual image of the hospital's interior can be verified visually in the design stage.

● Share new design concept with staffs and hear their requests

VR technology and simulation allows you to present the validity of the new design concept to hospital staffs in the design stage. You can not only obtain consensus from them but also get their feedback on what they need and what needs to be improved, a recipe for prior consideration, which in turn prevents reversion and helps you make decisions and improve stakeholder satisfaction.

● Communication with the locals (from the standpoint of patients/residents)

VR technology was exploited to reproduce the interior design of the hospital and its surrounding environment using 3D models for an intuitive presentation to patients and local residents. Anyone with a tablet or Smartphone regardless of its performance can take control of the VR environment on their own browser from anywhere so long as they use VR-Cloud®.

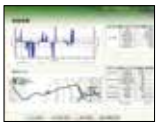
● Driving Simulator for Rehabilitation

Rehabilitation of brain function：Brain can be revitalized by driving.
Rehabilitation of bodily function：As driving involves bodily movement, it helps rehabilitate bodily function.
Complete recovery：Patients will take driving training to improve their driving skill, and to make them to obey traffic, with the ultimate goal of complete recovery.

■Rehabilitation of stroke patients
A virtual driving simulator for assessing driving skill of patients undergoing rehabilitation. Patients' health condition and maneuvering skill can be tested.

Case study: "Road monitoring system" by Temasek Polytechnic (Singapore)

■Driver training using Safety Driving Simulator
A driving simulator that adheres to the certified standard of the driving simulator stipulated by the JAPAN TRAFFIC MANAGEMENT TECHNOLOGY ASSOCIATION. At the end of the drive, driving skill is assessed on a driving log. See P.48 for detail.



■Driving Simulator for Seniors
Project conducted in the Department of Informaton Engineering, Faculty of Science and Technology, Meijo University involves the use of driving simulator to confirm the decline in cognitive skills, and to assess and improve driving skills. See P.47 for detail.

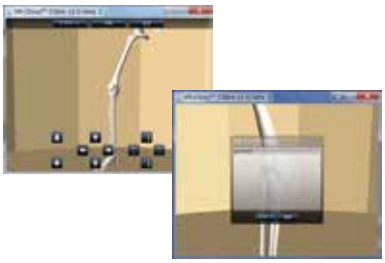
Driver stress: Low (Pedestrian only)
Driver stress: Medium (on-coming car only)
Driver stress: High (Pedestrian + on-coming car)

● Driving Simulator for the medical field, and the use of VR

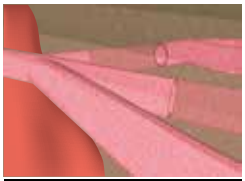
■Wheel-Chair Safety Simulator
Wheel-Chair Safety Simulator was developed in collaboration with the Faculty of Science and Technology, Kansai University. The VR environment of UC-win/Road was used as the visual display of the simulator itself. See P.56 for details.

■Drinking and Driving Simulator
This simulator lets virtual drivers see what it feels like driving when their central nervous system and balanced system are impaired, contributing to higher driver awareness on the dangers and harms drinking and driving can do to you and others.

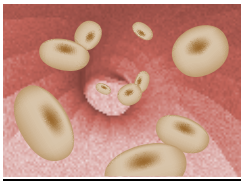
■Artificial knee joint implant surgery simulation
Surgery simulation is executed based on the VR data created by referring the CT data of a patient about to undergo surgery. Procedure of bone collision test and knee bend test following the surgery can be browsed on VR-Cloud®.



■Blood Vessel Simulator for education and research
The blood flow within blood vessels is visualized within the VR environment to confirm the scene of each and every blood cells flowing through vessel.



Red heart pumping on the left.



Doughnut shaped red blood cells carry enzymes from lung to the entire body

Customized development service for Android™

Android™ terminal application including smartphone and tablet has been developed. Providing the application using its portability due to the mobile terminal and ubiquitous ability enables users to contribute to improving the operational efficiency and developing new business.

■Development of Android™ application

An application used via Android™ can be developed. Since this is the native application (developed via SDK and programming language of Java and C/C++), this can access directly to hardware resource, which allows to provide the high performance. In case of general sales, the application will be registered to Google Play Store.

■Development of Web application

An application operating on web browser can be developed via HTML5 / CSS / JavaScript etc. There are multiple advantages in this way of development; This has high affinity with PC, there is no need to support various hardware specifications with 1 application and it is easy to create an application including groupware etc. Other than a new development, application development could be transferring existing software, or software customization.

Proposal of development solution

Android™ customized development service

Tool to check a bridge Tool to manage the construction site Measuring support system Construction Simulation CAD viewer Service for providing the information in facilities	**Design for civil engineering and architecture**	**VR**
		Visualizing application online System to visualize the hazard map in 3D environment Urban design Medical VR Management of robot and facility 3D manual Application for calculating daylight
Data sharing system Work management system Medical system Mobile dash board/ Report function	**Groupware**	**Other systems**
		Educational training system Web Conferencing system AR visualizing system Cloud rendering service

Development method of customized development service

Newly development

A lot of time and cost is required to develop, however, t is possible to develop it in the flexible way to provide the high quality application and service.

Porting an existing software

Method to port an existing software for Android. It is possible to port and develop not only software which the customer already has but also various software of FORUM8 including VR, FEM and CAD etc. and web system.

AR.Drone

The existing software can be provided at a low cost by remote-controlling the software set in the server from Android terminal via Anything as a Service which is a large amount of data transmission technology of FORUM8.

Customizing existing software

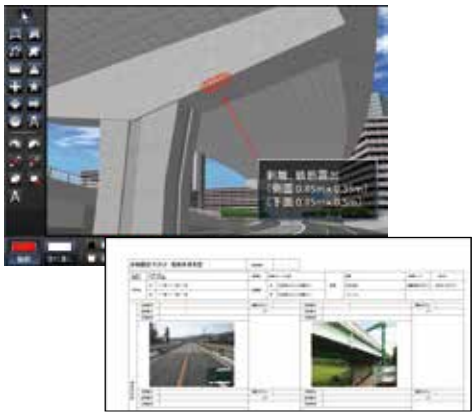
Customizing system using VR-CloudR effectively which uses 3DVR on cloud server can be built and provided.

Development proposal

■Design for civil engineering and architecture

•Tool to check a bridge

System to support for visual checking the damage situation of a bridge. It is possible to check the checking contents and working sites, manage the taken pictures, draw the damaged parts and patterns and write down the evaluation. It is also possible to draw the damaged parts in 3D environment and link with the Bridge Checking System (PC version).



•Tool to manage the construction site

Management tool for the construction sites which allows you to check the process, problems and construction drawings at the construction sites. Comments, pictures, movies, and other information can be put on the drawing that is posted on the server, from a client PC.

It is possible to save the energy for creating a report by inputting this construction information at the sites.

•Construction Simulation Viewer

The construction process can be visualized in the time series. This allows to check the process for temporary construction, underground installation of power transmission cables and removal action of pedestrian overpass etc. and the results of construction simulation.

•Service for providing the information in facilities

Buildings, stations, and other commercial facilities are visualized within the VR environment in which maps inside these buildings with offices and stores can be seen to confirm their location and information, and to search for an optimal route to

■VR

•Visualizing application online

All types of online system including an application that displays 3D model of houses, stores, and office buildings, and an online shopping system that allows you to view merchandises from an angle of your choice, can be developed based on a simple and light all-purpose visualization program designed to be run on a mobile device.

•System to visualize the hazard map in 3D environment

A system that visualizes the result of damage prediction and a 3D hazard map with areas at risk. In addition to the visualization of tsunami and fire propagation simulation, the system can display the direction to an area of refuge, manage information from variable message signs and GIS, and display the risk level of the location you are at, which is acquired from the GPS.

•Application for calculating daylight

By inputting information related to an architectural building, the lighting condition of the building at any specified date and time can be visualized. Sharing this data via cloud server opens up many possibilities such as obtaining stakeholder consensus at a community meeting.

■Groupware

•Work management system

A work management system that fit into the business style of each and every customer can be customized and offered at a low cost. Such systems include sales assistance tools like CRM system and Purchase Order system as well as those with email application and features for managing work schedule, work flow, and ToDo list.

•Data sharing system on cloud

File management and data sharing system that runs on cloud. Seamless data exchange between Android™ terminal and PC via cloud server is feasible.

•Medical system

FORUM8 developed a groupware that can run on an Android™ terminal and streamline all types of work that takes place at a hospital. Equipped with an application designed for patients, medical record, and an ability to book institutions, browse Q&A and details of medical treatment, and input questionnaires, the system is built in quest of 'convenience', which is an element that all medical institutions require.

■Other systems

•Educational training system

A system that provides all types of training including taking care of traffic accidents on roads and tunnels, training inside a factory, and an evacuation training using various scenarios.

•Web Conferencing system

FORUM8 developed a web conferencing system via video streaming that takes advantage of the "a3S", FORUM8's in-house developed high capacity data transmission technology.

■A Rough Estimate for Reference

Development of a function to control a virtual steering wheel	
A rough estimate (10 man hours)	US$5,000
Virtual driving via VR-Cloud®, one of FORUM8's products, is feasible on a tablet using the gyro feature equipped within the tablet.	

Solution for the Manufacturing Industry

Proposal System

FORUM8 will deploy a solution for the manufacturing industry in which UC-win/Road that is being used extensively for the assessment of buildings and roads as well as for driving simulation is applied for designing factories and evaluating factory's interior layout. In particular, the solution is ideal when it comes to designing the factory's layout in such a way as to streamline the transport of goods and increase employees' productivity for assessment. In situation when a new factory needs to be built, or when an assembly line or manufacturing process needs to be altered, the solution will help you design and review the predicted result considerably.

■Work flow

Below is the work flow of design / assessment of the interior layout of factory or distribution center, as an example of a solution for the manufacturing industry applied in real life. The work flow is activated through the use of UC-win/Road.

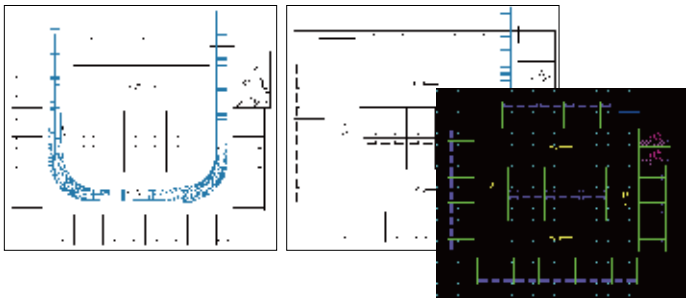
Create plan view	Define basic layout (columns/wall/entrance and exits/corridor, etc.) in a 2D plan view
↓	
Place equipments/people/goods	Define the position of equipments / people / goods on the 2D plan view.
↓	
Define movement of people/goods	Define path on which people/goods move and their moving speed
↓	
Assess using UC-win/Road	Make everything 3D and verify equipment allocation and movement of people/goods

■Create plan view, place objects/equipments

Plain view can be created easily as if using 2D CAD.

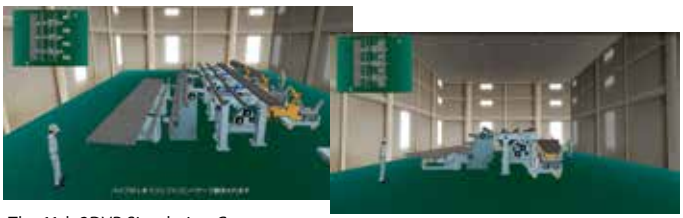
■Define movement of object

Vehicle trajectory resulting from making regular turns or from stopping and turning can be displayed only by assigning vehicle's driving route.



■Assess using UC-win/Road

Movement of each vehicle within the 3D model can be assessed.



The 11th 3DVR Simulation Contest
"Simulation for pipe plant facility" Kusakabe Electric & Machinery Co., Ltd.

■Example of factory modelin

3D model of Car assembly line inside a factory can be created.

■FORUM8 provide Factory design applicatio

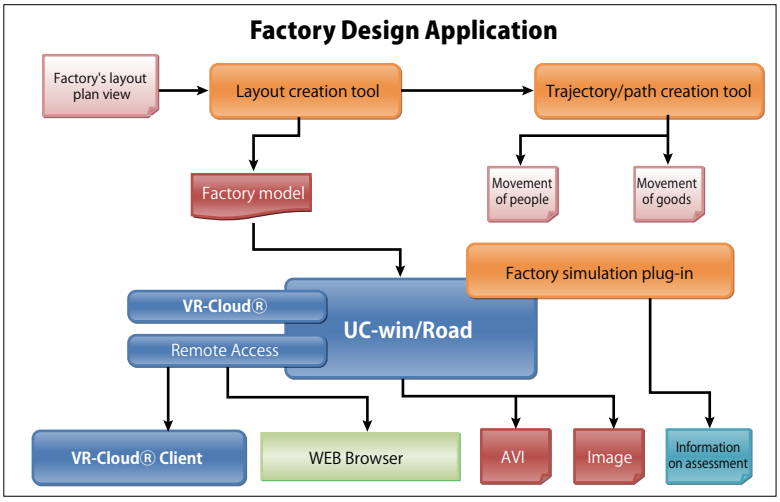
This is an ideal application for customers that wish to design and assess factory's interior layout. Entire environment including a series of applications that assist data creation is offered, allowing customers to create and evaluate data on their own.

UC-win/Road
Displays 3D environment and movement of people/objects.

Layout creation tool
A simple 2D-CAD designed to create the layout. Created data can be converted to 3D models of UC-win/Road.

Trajectory/path creation tool
Trajectory/path of vehicles/people can be confirmed on 2D view.

Factory simulation plug-in
Trajectory/path data is loaded to UC-win/Road to initiate simulation.



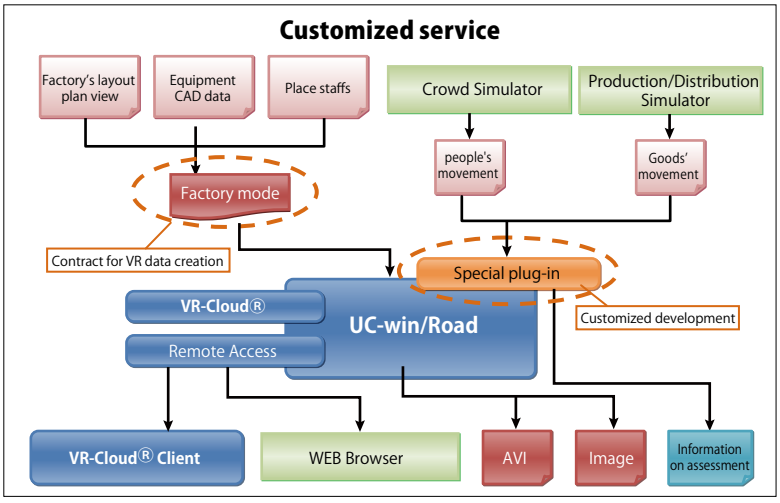
■Customized service

This is a service tailed to each and every customer who is already using other design tools or assessment system (such as production simulator) but wish to visualize the entire design/assessment process in 3D environment for easy interpretation of the procedure.

UC-win/Road
Displays 3D environment and movement of people/objects.

Customized development
Data describing the movement of people/goods outputted from a 3rd party system are loaded to UC-win/Road for visualization, and information on the collision between moving people/goods is outputted. A system that meets customers' specifications can be developed using the UC-win/Road SDK.

Contract for VR Data creation
Factory model to be visualized in UC-win/Road is created based on information provided.



■Result of investment

The following can be realized if you invest in FORUM8's solution for the manufacturing industry.

Environmental assessment
Validity of the positioning of equipments and people's movement can be assessed.

Assessment Index
Quantitative assessment such as calculating the number of collisions between people and objects as well as distance between them is feasible.

Consensus formation
3D environment can be presented and explained to stakeholders to reach a consensus.

Work instructions
Work instructions can be visualized for easy communication with the workers.

FORUM8 Surveying Solutions

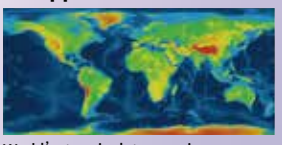
Integrated solutions that involve GIS / 3D Laser scanning / 3D Survey & Civil Engineering CAD

We offer integrated surveying solutions such as point cloud measurement by 3D laser scanner and VR modeling of point cloud data via UC-win/Road; data exchange between 3D survey CAD and civil infrastructure design CAD, and VR system; and building a system that links GIS to VR technology.

3D Virtual Reality
UC-win/Road Surveying feature & services

UC-win/Road

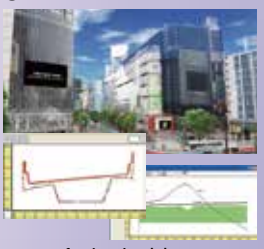
●Supports Land Terrain and Seabed terrain of this world



World's terrain data covering more than 100km is available

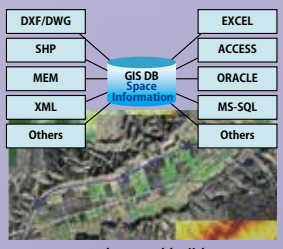
Seabed terrain

●Point cloud data modeling



Import of point cloud data and 3D modeling

●UC-win/Road for GIS

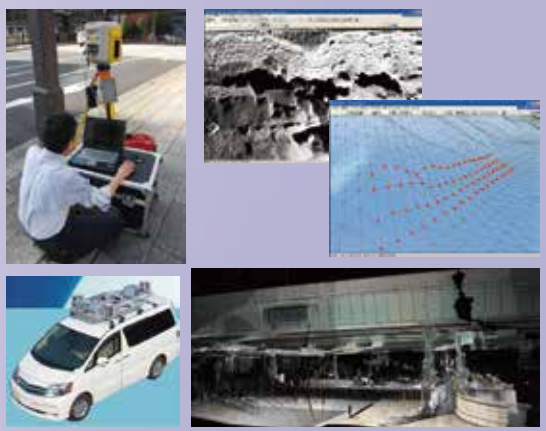


Imports GIS data and builds 3D GIS system

Point cloud data

3D VR Engineering Service

●3D Laser Scanning / Modeling Service.



We offer 3D laser scanner point cloud measuring & modeling service

Point cloud data

●3D Point Cloud / As-Built Management Plug-in
●3D Scanning / As-Built Management VR Modeling

Difference between Design data and point cloud data is measured to create as-built drawing

Data exchange
LandXML
DWG/DXF

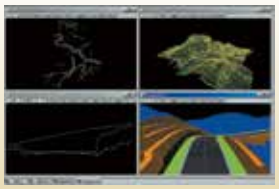
Data exchange
IFC
3DS

Data exchange
Shape
IFC
DWG/DXF
LandXML

Data exchange
CYBERJAPAN/ GIS standard
Shape
DWG/DXF

3D survey & Civil Engineering CAD

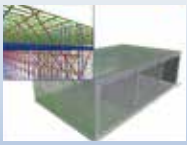
●12d Model



Survey & Civil Engineering Integrated Software

Civil Infrastructure Design CAD

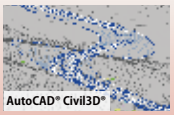
●UC-1 Road Work Design series
●UC-1CALS/CAD



Civil Design Calculation Software

Land forming / Road CAD

●AutoCAD® Civil 3D®



We offer a total solution that involves the designing of road and landform, and VR simulation.

Solution for Municipalities / GIS System

VR-Cloud®

PR / Contents sharing system

GIS Customized System

Customization service to build GIS System

Customized Development Service

We build various systems

Soil contamination information DB / ground information DB

Soil contamination information DB ground information DB

Web System that shares Seabed Terrain

Web System that shares Seabed Terrain

Road Damage Information System

Registers areas where roads are damaged in emergency and non-emergency situations. Those areas can then be browsed.

BCP Assistance Tool

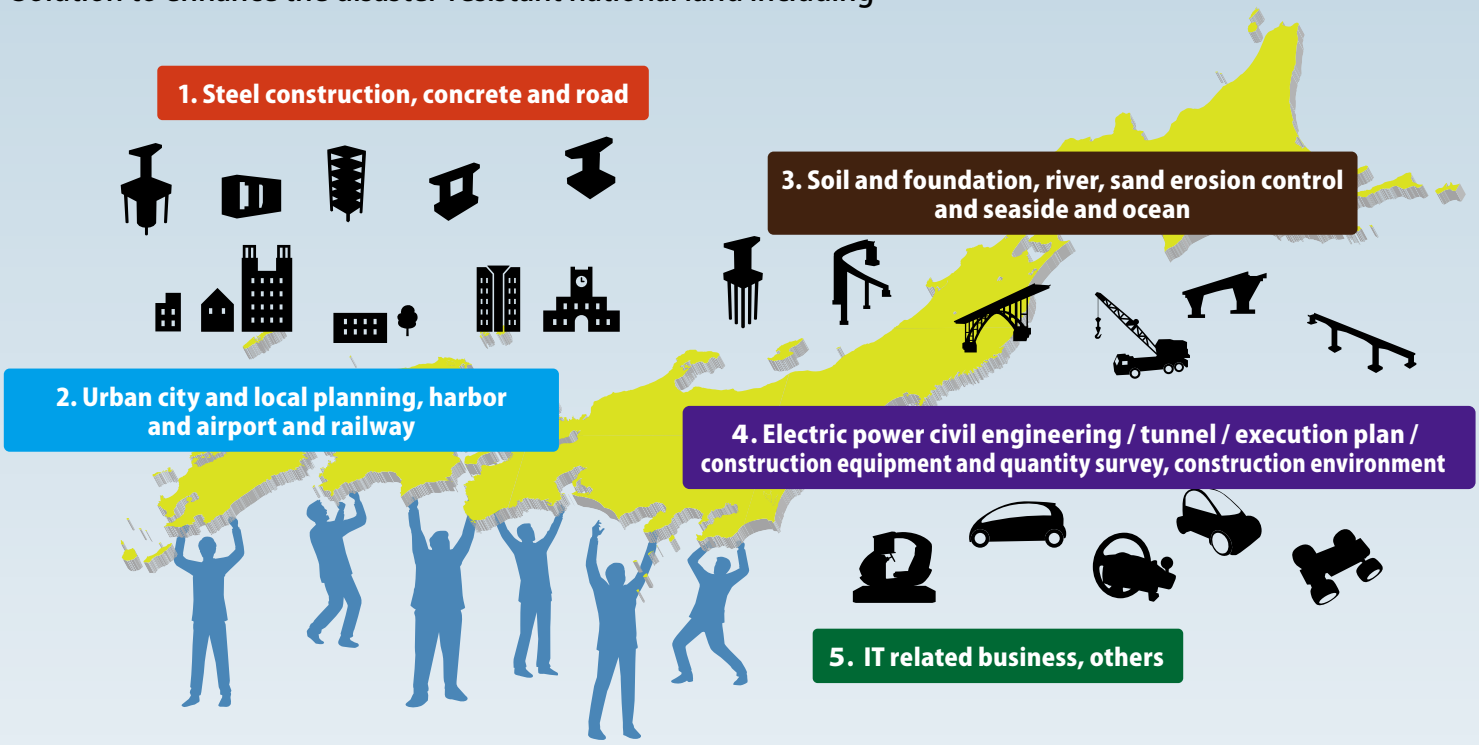
Helps you organize BCP (Business Continuity Plan)

National Resilience Design Solution

National Resiliency Design and Support Solution

Civil engineering design and business related to IT based on national resiliency are supported.

Solution to enhance the disaster-resistant national land including



3D Digital City・GIS

A "City simulator" that imports city information to a 3D city model on which all types of simulation can be run was built. We offer various earthquake measures and solutions on an urban scale.

- Scenary simulation
- Traffic Flow Analysis
- Road Damage Information System
- Map showing earthquake prone areas / GIS
- BCP Assistance Tool
- BCP assistance and BCMS configuration support services

Solution for Disaster Prevention due to Earthquake

FORUM8 offer tools and technical services for verifying structures' safety, cost performance, and seismic capacity, and for assisting with reinforcement design. FORUM8 will propose many safety measures/solutions including tsunami analysis, evacuation analysis, and Earthquake Early Warning System.

- Structural analysis／seismic diagnosis services
- Inundation/Flood/Tsunami Analysis
- Ground Analysis / Liquefaction Measures
- Debris-Avalanche simulation
- Fire and Evacuation Analysis
- High-performance computing on cloud services

Information Display System

Information Display Systems such as the driving simulator; simulator that fuses miniature model and VR; and VR-Cloud®, cloud computing application that allows VR environment to be shared among anyone online, can be used for measures against earthquake.

- 6K Digital Signage System
- Driving Simulator
- VR Modeling sSystem
- Earthquake Early Warning

Design Verification / Maintenance & Management System

This system checks for critical errors in the design of civil structures. It includes maintenance/management and Bridge Inspection tool for concrete, helping customers with their bridge maintenance/management work as well as their plan for measures to increase bridge's life span.

- Allplan（Architectural civil engineering）
- Structural Design Verification Support System
- Concrete Maintenance
- Bridge check support system
- System Designed to Plan measures to Repair Bridge and Increase its Life Span

UC-win/Road　VR-Cloud®　Allplan　Engineer's Studio®　3DCAD Studio®　EXODUS　xpswmm

UC-1 Series

Structural Analysis / Cross-Section・Bridge Superstructure Design・Bridge Substructure Design・Foundation Design・Temporary Work Design・Road work Design
Harbor・Sewerage and Stormwater・Geo technical Analysis ・CAD/CIM・Maintenance management / Earthquake risk・Architecture / Plant
GIS ／ System development service ／ 3D VR Engineering Service ／ Analysis support service

Ieiri lab experience report

" Construction IT journalist"
- seeking the growth strategy of construction industry using IT
Ryota Ieiri
Serial article on Up&Coming

●Vol.16 VR community development

Ieiri comment and proposal

Items that are to be the subject of the independent simplified environmental assessment "small assessment", which appeared in the lecture of Mr. Kasaki, include many analysis that are carried out in cooperation with the BIM (building information modeling) and CIM (construction information modeling) of the architecture field such as shade analysis, outflow analysis, and wind analysis. For designers and builders utilizing BIM and CIM, analysis necessary for "small assessment" can be carried out with less effort by making good use of the models of buildings and civil engineering structures. As well as the analysis of the designing and building necessary directly to the business, carrying out extra analysis for the surrounding area, bringing together as small assessment and by explaining it, the sense of security and trust of the residents of the surrounding area will further increase. By expressing the weather assumed by the small assessment, consideration conditions such as season and time, and the analysis results of those all together in VR, the facilitation towards the residents will further increase.

Future prospects of the product

Also in the environment assessment academic society held in Hosei University in Iidabashi, Tokyo on September 14th, Mr. Kasaki has presented, in combination with demonstrations of UC-win/Road, about the small assessment of sediment collecting field of Omachishi. Opinions highly rating the understandability appeared one after another from the experts of environmental assessment in the hall. BIM, CIM, and VR is starting to spread in the field of architecture and civil engineering, but hereafter, the task will be to broaden the application of these tools in the environmental assessment field. By the collaboration of experts of architecture, civil engineering, and environmental assessment, a more effective small assessment could be realized.
This could be also useful for the national resilience of Japan.

▲Elicit hidden opinions of the residents through workshops
(Source: Mr. Kasaki Hiroo)

▲An example of a workshop that modelled the element of the city drawn on a paper by the children at the left side at real time in VR

▲ An example which dangerous places hidden in the city were made into VR and information was shared by everyone

●Vol.18 UC-win /Road Expert training seminar

Ieiri comment and proposal

This time's seminar was not for improving the operation skills of a software, but it was for improving the ability to practice "management consulting" through a software. As the author himself possesses a qualification of a management consultant called small and medium enterprise management consultant, he has fully realized about it.
Currently, BIM (building information modeling) for the field of architecture and CIM (construction information modeling) for the field of civil engineering is starting to spread, but what is common between the two is not just that it uses a three dimensional design software as a tool. It brings profit by carrying out an application that is closely cooperated with the company's management strategies such as to which business of the company should the BIM and CIM be used, in combination with which software should it be used, and what kind of new products/services should be provided to what type of customers. In plain words, both BIM and CIM are going to be "complicated products". In order to sell these kind of products, consulting ability towards customers is essential. And if the customer introduces the product and succeeds in business as well, there is no need to mention that the agency will receive repeated orders including consulting.

Future prospects of the product

UC-win/Road went into the 14th year since its release. It is a three dimensional virtual reality software as if it was waiting for the spread of BIM/CIM recently. Hereafter, the expansion of it should be done fitting the spread of BIM/CIM. As for the expansion of the entire region, a creation of a CIM model of few tens of square km putting together the entire new section of the railway into one became possible. The fact that the UC-win/Road Ver.9 has relaxed the conventional 20km×20km restriction and that it copes with a generation function of a large scale terrain of over 100km can be said that it followed the flow. Besides this, there are ideas such as adding a switch and a control panel function used in BEMS (energy management system for buildings) ,which is used in the maintenance management field, into BIM models for BIM, and cooperating real time information of sensors installed to existing structures with CIM models for CIM. UC-win/Road is also expected to provide understandability and usability that exists only in virtual reality, fitting the trend of BIM/CIM.

The import function of the building model by the BIM's data exchange standard "IFC format" is also quipped ▶

◀ In the DVD distributed to the participants, data such as sample data and sales manual of about 4GB was closely packed

The Association of State of the Art Technologies in Visual Expression

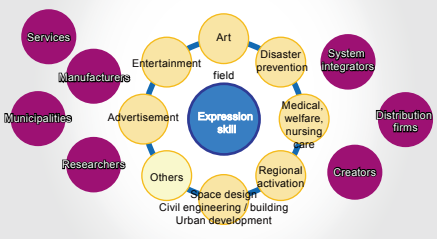
http://soatassoc.org

The Association of State of the Art Technologies in Visual Expression(Abbreviation : Hyogikyo): Members wanted
An organization to manage the state-of-the-art technology for expressionists. It contributes to the society through human resources development of technology developers of the state-of-the-art technologies in expression and the application of the new technologies in expression.

Contents of activities of the Hyogikyo
1. Holding workshops promoting the use of latest technologies and symposiums
2. Support of expression project using latest technologies
3. Holding contests
4. International exchange
5. Various promotional activities of exhibitions and publications
6. Holding qualification examinations and human resources development related to expression technology

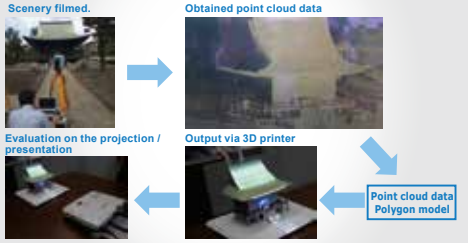
Groups of the Hyogikyo Creative group User group
Product group Others (Start up by a member's proposal possible)

Usage fields of expression technology and connected industries



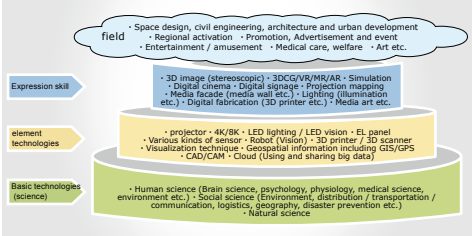
Examples of use of expression technology
The use of 3D printers in projection mapping

Examples of use of expression technology
The use of 3D printers in projection mapping



Application case "The use of 3D printers in projection mapping"

Expression technology of related fields



Membership fees and membership services

Types of member	Annual member-ship fee	HP		Mailing list		Seminar		Consulting		Facilities/Equipments		Participatio to sectional meeting / Proposal of commission-ing
		Post a link to members list	Post a link to related news.	Regist-ration	Information updates to members.	Attendance only	Lecture	Match-making	Advice	Can be provided	Usable (members' price)	
Corporate	US$1,200	●	●	●	●	3	3	●	3	●	●	●
Individual	US$60	●	●	●	●	1	1	●	1	●	●	●
Information	US$30	–	–	●	–	1(free)	–	–	–	–	–	–

* The annual fee is valid for one year from the month joined *There is no admission fee

ITS World Congress Tokyo 2013 report

Over 20,000 people from 65 countries participated in the first venue in Japan in 9 years.Several number of FORUM8's DS played the active roles at multiple booths.

FORUM8's different kinds of DS got a lot of attention even from persons concerned from overseas.

FORUM8 showcased the following products based on 6K Multi-cluster Digital Signage.

1) Presentation with experience corner for UC-win/Road Ver.9 New features / ADAS function
2) F1 race experience via network / multi driver synchronous driving function
3) Parking solution via VR-Cloud and UC-win/Road
4) UC-win/Road train simulator
5) Training system for tunnel management "G'Val"
6) Ultra Micro Data Center

Especially what visitors from Japan and overseas got interested in was UC-win/Road Experience Simulator. The experience corner with 6K Multi-cluster Digital Signage had also great success.

On the other hand, the member of BMIA in France who developed "G'Val" told that they would like to showcase their system in ITS World Congress in Bordeaux held in 2015.

Alternatively, we could see various types of simulators at the exhibition site. Specifically at this congress, many of exhibitors introduced UC-win/Road Driving Simulator including ITS Experience Simulator of Central Nippon Expressway Company Limited., DSSS Experience Simulator of the National Police Agency and UTMS Society of Japan, VICS Experience Simulator of Vehicle Information and Communication System Center (VICS Center), COOPERATIVE ITS Driving Simulator of TOYOTA Motor Corporation, 3 types of Driving Simulators which have different concepts for each of AISIN SEIKI Co., Ltd. and a simulator of driver support of Fujitsu Limited.

They all achieved the advanced and various kinds of function of ITS and attracted much interest from many visitors.

Several number of FORUM8's DS played the active roles at multiple booths.

▲VICS Experience Simulator

▲3 types of Driving Simulators which have different concepts for each of AISIN SEIKI Co., Ltd.

▲COOPERATIVE ITS Driving Simulator of TOYOTA Motor Corporation

▲Experience Simulator of the National Police Agency and UTMS Society of Japan

▲ITS Experience Simulator at the joint exhibition booth of MLIT Japan and highway companies

▲A simulator of driver support of Fujitsu Limited.

The 14th VR Conference

Design Festival Day 2 kicked off with the "VR Conference" in the morning, which comprised of the opening special lecture followed by the Awards Ceremony to present the awards of the "The 12th 3D VR Simulation Contest on Cloud". In the afternoon, "General Session" was held followed by "Driving Simulator Session", both of which constitutes "The 14th UC-win/Road Conference". Both conferences took place in the Shinagawa Intercity Hall.

Organized : FORUM8 Co., Ltd.
Date : Sep. 19, 2013
Venue : Shinagawa INTERCITY Hall

The 14th UC-win/Road Conference General / Driving Simulation Sessions

[Special Lecture] " Instant and Flexible 3D Reconstruction Using a Digital Camera"

Masatoshi Okutomi Professor in the Graduate School of Science and Engineering Department, Tokyo Institute of Technology

He gave an explanation about the technology to restore camera position for shooting and the intended 3D structure by processing the image shot in the various directions. This method which he was involved can obtain the restore results by immediately processing the shot image, so it is possible to confirm the restored results up to a given time and effectively shoot the required images. In this lecture, he introduced the development overview and the case study of processing results along with the typical explanation about related technology.

[Special Lecture] "A New Development of 3D/VR/AR"

Hiroyuki Hakura President of 3D and special-appointment professor of Digital Hollywood Co., Ltd.

S3D images has been expanded to many kinds of applied fields such as entertainment, medicine and education etc. and recently its expressive skills have been improved from "Virtual" to "Real" like 3D projection mapping and 3D printer. Especially 3D printer and 3D projection mapping, which had been centered on the use for industries, were combined to use for AR and VR and the works for education, trainings, entertainment and art have been created. These new development was introduced.

[Special Lecture] The Latest Case Studies of 3D Projection Mapping and its Future Development

Mamoru Hanzawa
General Manager of Japan office of Christie Digital Systems, Inc.

Christie Digital Systems, Inc. provides the world-class projection solution and system integration services. The images with stable and high-precision created by this company's projectors are spreading the images' world and being used for various fields in which the advanced projection is required. He introduced the strides which this company is making for 3D projection mapping, the latest case study for images with high-precision and high-resolution via a DLP projector and its future development.

[Special Lecture] Simulator via high-performance motion and case studies of testing device

Koji Masuno
Application Engineering of Moog Japan Ltd.

High-performance motion systems are used in various fields as a simulator for vehicles research and development, training simulator for plane operation and vibration test device etc. MOOG Inc. are providing users in the world with a number of motion systems. Systems using high-performance motion especially allow to improve the process of research development. He introduced some introduction examples focusing on European countries and the method for effective use of high-performance motion.

[Special Lecture] Use of Simulation in the Field of Information Processing for Accident Prevention and Safety

Koji Oguri
Professor in information Science, Aichi Prefectural University

In addition to the vehicle information via multi-display simulator which was refurbished from an actual vehicle and 6-axis motion simulator system belonging to his laboratory, world-class research results about biosignal analysis of drivers, estimation technologies for drivers conditions, such as the mental load and sleepiness and the action prediction have been published. He has acquired a lot of patents about the estimation technologies for drivers conditions. The future development of the next-generation driving simulator along with these research results was introduced in this lecture.

[Special Lecture] Development of ICT Technology and Future Development in the Use of Simulation

Shuichi Matsumoto
Lecturer in the science and engineering department, Keio University

With the rapid developments in ICT, various kinds of new approaches which was unfeasible with only conventional information communication technology are now becoming possible. Even in the world of simulation, development for elemental technology and research for actual use and its possibility of actual use have been very large. In this lecture we took a look back about the simulation technology and its case studies so far and the future possibility for use of simulation was also introduced.

4th The 4th Student BIM&VR Design Contest on Cloud

-Competition for designing an advanced construction engineering-works on Cloud, making full use of BIM/CIM and VR ! -

Virtual Design World Cup
THE 4TH STUDENT BIM & VR DESIGN CONTEST
ON CLOUD SERVICES

Theme 2014 "Sustainable Olympic Town in Tokyo Bay 2020"

A total of 36 teams (15 from Japan, 21 from outside Japan) entered the Virtual Design World Cup (VDWC), The 4th Student BIM&VR Design Contest on Cloud Services (Organizer: VDWC Executive Committee), and out of these, 15 were nominated in the 1st round review in July 2014. On 20 November 2014 during the FORUM8 Design Festival 2014, the nominated teams all attended the Awards Ceremony (either in person or online) for the final evaluation of their project by the judges to take away their prize.

World Cup Award

「The S.T.A.R.S.」

Kanazawa University　KUUPL

Overview

Accommodations, means of transport, and entertainment for the visitors to the Tokyo 2020 Olympic games will all be provided. The harbor will be developed into an attractive and rich environment from the standpoint of landscape design, turning the current image of the harbor seen as a place for industrial activities around. With an aim to protect the environmental in and around the Tatsumi area and to develop the area sustainably, cost performance in the aspect of both visual quality and environmental protection will be maximized.

Excellent Award

「Tokyo_Sustainable Development」

University of Transport and Communication　INED_UT

Overview

plans to secure new traffic route by constructing a new bridge and to mitigate congestion likely to be triggered by surging crowds during the games will be proposed. This idea will be put into effect in order to save energy consumption towards the sustainable development in not just Tokyo Bay but throughout the Japanese archipelago and to solve issues expected ahead of the plans.

Judge's Special Prize

Sustainable Design Award

Prof. Yasushi Ikeda
(Graduate School of Keio University / Chief of executive committee of VDWC / Representative of IKDS)

「Connected Yumenoshima, Optimised Circulation for the Olympics」

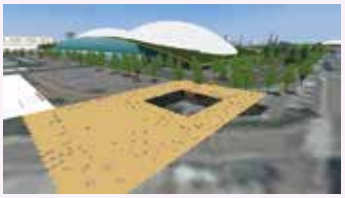
Robert Gordon University　International Architectural Think Tank Inc.

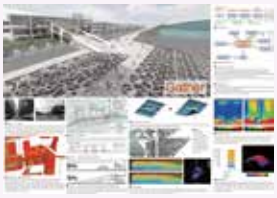
Civil Design Award

Mr. Yoshihisa Hanamura
(Director of NPO Civil Machizukuri Station) / Vicechairperson of Liaison Council of Construction NPOs)

「gather」

Tokyo University + Yamaguchi University　T.O.F.U

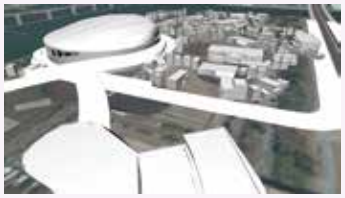




Forsight Award

Prof. Kostas Terzidis
(Associate Professor, Harvard University, USA)

「Walkerizing City」 Shibaura Institute of Technology / Graduated school of Shibaura Institute of Technology　shellfish



Top of The World Award

Prof. C David Tseng
(National Chiao Tung University, Taiwan / Representative of CitiCraft architectural office)

「√SHINKIBA」

Ritsumeikan University　DDP

VR-CLOUD® Vote on cloud via VR-Cloud®
Awarded works can be seen! vdwc.forum8.jp

The judgment of this contest is conducted via VR-Cloud® which is a consensus building solution which uses 3D and VR on a cloud server.

3rd The 3rd Student BIM&VR Design Contest on Cloud

-Competition for designing an advanced construction engineering-works on Cloud, making full use of BIM/CIM and VR ! -

Virtual Design World Cup

THE 3RD STUDENT BIM & VR DESIGN CONTEST ON CLOUD SERVICES

Theme2013 " Sustainable Station Front in Global Metropolis"

World Cup Award

Title : **Breathing Station** Team Name : Nihon University HULAN

World Cup Award

Title : **Drafty Port** Team Name : Shibaura Institute of Technology Red.

Over the Rainbow Award

Prof. Hiromichi Yoshikawa (Professor of Disaster Prevention Engineering, Urban and Civil Engineering, Faculty of Engineering, Tokyo City University)

Title : **Bon Voyage**
Team Name : Shanghai Maritime University TransSMU

Civil Design Award

Mr. Yoshihisa Hanamura (Director of NPO Civil Machizukuri Station) / Vicechairperson of Liaison Council of Construction NPOs)

Title : **Sakura in the sea**
Team Name : Shanghai University dream of team

Tower of Pwer Award

Prof. C David Tseng (National Chiao Tung University, Taiwan / Representative of CitiCraft architectural office)

Title : **tokyo bay tower**
Team Name : Takushoku University nagami design squad

Over the Rainbow Award

Prof. Kostas Terzidis (Associate Professor, Harvard University, USA)

Title : **WIND DAM**
Team Name : Yamaguchi University shows

Urban Rediscovery Award

Prof. Kazuhiro Kojima (Coelacanth And Associates / Professor of Yokohama Graduate School of Architecture (Y-GSA), Yokohama National University)

Title : **sibakara**
Team Name : Nihon University DOVIO

2nd The 2nd Student BIM&VR Design Contest on Cloud

-Competition for designing an advanced construction engineering-works on Cloud, making full use of BIM/CIM and VR ! -

Virtual Design World Cup

THE 2ND STUDENT BIM & VR DESIGN CONTEST ON CLOUD SERVICES

Theme2012 "Sustainable Design of Marine City"

World Cup Award

Title : **Noah's Ark -Tokyo 2050-**
チーム名 : Shibaura Institute of Technology SWD LAB
(建築設計情報研究・澤田研究室)

Excellent Award Modern&Nostalgia Award

Mr. Hiromichi Yoshikawa (Tokyo City University)

Title : **City of Dreams**
Team Name : Shanghai University 1205
(コミュニケーション・情報工学学部)

Excellent Award

Title : **Fisland**
Team Name : Nihon University JT&SO
(構造・デザイン研究室)

Environmental Design and Information Technology Award

Mr. Tomohiro Fukuda (Osaka University)

Title : **'s SITE**
Team Name : Hosei University spatial analysis lab
(法政大学大学院、空間分析研究室)

Challenging Award

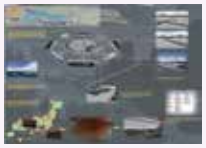
Mr.Tomohiko Yamanashi (Nikken Sekkei)

Title : **The floating town**
Team Name : Shibaura Institute of Technology ANT
(建築設計情報研究・澤田研究室)

Arche Polis Award

Mr. Kostas Terzidis (Harvard University)

Title : **The Poseidon**
Team Name : Nihon University SF-JNT2
(構造・デザイン研究室)



Civil Design Award

Mr.Yoshihisa Hanamura (NPO Civil Machizukudi Station)

Title : **JUGEMU**
Team Name : Nihon University TOKU-16th
(構造・デザイン研究室)

1st The 1st Student BIM&VR Design Contest on Cloud

-Competition for designing an advanced construction engineering-works on Cloud, making full use of BIM/CIM and VR ! -

Virtual Design World Cup

THE 1ST STUDENT BIM & VR DESIGN CONTEST ON CLOUD SERVICES

Theme2011 "SHIBUYA Bridge"

World Cup Award

Title : **The Oasis**
Team Name : Kanazawa University Urban city Lab

Civil Design Award

Mr. Yoshihisa Hanamura (NPO Civil Machizukudi Station)

Title : **Shibuya Sky Way**
Team Name : Nihon University Structure and Design Lab of Nihon University

Enorasis Award

Mr. Kostas Terzidis (Harvard University)

Title : **B-side**
Team Name : Shibaura Institute of Technology isue-y

Environmental Design and Information Technology Award

Mr. Tomohiro Fukuda (Osaka University)

Title : **Tokyo2020**
Team Name : Shanghai University Dream creation

Best Rendez-vous Place Award

Mr. Hiromichi Yoshikawa (Tokyo City University)

Title : **Hatching the Future**
Team Name : Hong Kong Polytechnic University WEdoit

Challenging Award

Mr.Tomohiko Yamanashi (Nikken Sekkei)

Title : **Amoeba**
Team Name : Yasushi Ikeda Lab of Keio University SFC

Organizers : Cloud Programming World Cup Executive Committee

2nd The 2nd Student Cloud Programming World Cup

-Put your 3D VR Cloud application programming skills to the test using FORUM8's Software Development Kit (SDK)!-

THE 2ND Cloud Programming World Cup

Put your 3D VR Cloud application programming skills to the test using FORUM8's Software Development Kit (SDK)!

A total of 9 teams (4 from Japan, 5 from outside Japan) entered the Cloud Programming World Cup(CPWC), The 2nd Student Cloud Programming World Cup (Organizer: CPWC Executive Committee), and out of these, 9 were nominated in the 1st round review in July 2014. On 20 November 2014 during the FORUM8 Design Festival 2014, the nominated teams all attended the Awards Ceremony (either in person or online) for the final evaluation of their project by the judges to take away their prize.

World Cup Award 「Kinect Smart Drive」 Shanghai Jiao Tong University Great Sword

Kinect Smart Drive combines Kinect drive and smart drive (automatic assist drive) together. User can use it in UC-win/Road with a Kinect sensor. For the user who do not have kinect, can just use smart drive functions. It is not only a software plug-in, but also a game system, even can be a good tools for researchers reseach about the automatic drive. We hope everyone can have fun with this wonderful plug-in.

Judge's special prize

Environmental Design and IT Award

Tomohiro Fukuda
(Head of judges and associate professor from the Graduate School of Engineering Osaka University)

Unmanned Ground Vechicle Award

Mr. Hiroyuki Hakura
(Delegate of "the Forum for Advancement of Stereoscopic Three Dimensional Image Technology and Arts" / Designated Professor of Digital Hollywood University, Graduate School)

「Analysis of drive behavior in shared spaces and architecture of large scale simulation environments」
Sugiyama Jyogakuen University Chocolat

「Building of a test environment for automatic driving systems」
Kyushu University SDL

Cloud-sourcing Award

Prof. Taro Narahara
(Associate professor from the College of Architectural Design, New Jersey Institute of Technology)

Real World Application Award

Pencreach Yoann
(Technical Manager of FORUM8 VR development)

「Openstreetmap import and navigation plugin」
Shanghai Maritime University Torneko

「Driving Support Plugin」
Kansai University Kaisers

1st The 1st Cloud Programming World Cup

-Put your 3D VR Cloud application programming skills to the test using FORUM8's Software Development Kit (SDK)!-

World Cup Award

Title : **Image View Event Plugin/Image View Slave Plugin, Contec Scenario Event Plugin**
Team Name : Team Name : Kyoto University KU-ITS

＜**Concept**＞
Plugin that UC-win/Road able to cooperate with NIRS and display image and text on cluster client.

Brain Activity Award

Mr. Hiroyuki Hakura
(Delegate of "the Forum for Advancement of Stereoscopic Three Dimensional Image Technology and Arts" / Designated Professor of Digital Hollywood University, Graduate School)

Title : **Mouse Driving Plugin**
Team Name : (Kyushu University) SDL

Emerging Talent Award

Prof. Taro Narahara
(Associate professor from the College of Architectural Design, New Jersey Institute of Technology)

Title : **Show the track of a vehicle**
Team Name : (Shanghai Jiao Tong University) Kungfu baozi

3D Simulation Award

Pencreach Yoann 氏
(Technical Manager of FORUM8 VR development)

Title : **Evacuation Data Import and Display**
Team Name : (Shanghai Univeristy) Cloud1205

3D・VR Simulation Contest

▼The contest has been held since 2002 after receiving the Product of the Year award. Works from the last 13 contests held in our public relations magazine Up & Coming and introductory reports on them are shown below.

13th 3D VR Simulation Contest by UC-win/Road

Date : 20-Nov-2014 Location : http://vrcon.forum8.jp

GRAND PRIX

"Cooperative ITS Driving Simulator"
TOYOTA MOTOR CORPORATION.

EXCELLENCE AWARD

Simulation for environmental upgrading around Higashi Takase river
Fushimi Technical High School in Kyoto

IDEA AWARD

QuikDeck Promotion VR Data
Nisso Industries Co., Ltd.

ESSENCE AWARD

DSSS Experience VR Data
UTMS Society of Japan

HONORABLE JUDGE AWARD

Regional Construction／Engineering／Design

Residential Building Design VR Simulation for N House
atelier DoN

Construction VR Simulation for the bridge replacement
SOZOTECH

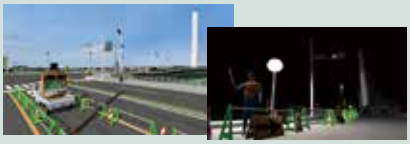
Onuma Floating Istands landscape simulation
Sanyu Eng. Ltd

12th 3D VR Simulation Contest by UC-win/Road

Date : 19-Nov-2013 Location : http://vrcon.forum8.jp

GRAND PRIX

VR Simulation for Traffic Regulation to Divert Traffic During Night Construction
Iwasaki CO., LTD.



EXCELLENCE AWARD

Driver Training and Assessment System of PCC (Pure Car Carrier) Simulator QUBE Ports and Bulk
QUBE Ports and Bulk

VR Simulation that at uses Tsunami/ Evacuation Analysis Results
Pacific Consultants Co., LTD.

IDEA AWARD

VR Simulator for Experiencing an Intelligent Driver's Seat
TS TECH Co., Ltd.

ESSENCE AWARD

VR Model of Osaka's Underground Shopping Mall
Graduate School of Osaka University

HONORABLE JUDGE AWARD

Regional Construction／Engineering／Design

VR Simulation for an Urban Expressway with U-Turn Road
SOZOTECH

Proposal of a New Engineering Method for Installing Single Track Railway Bridges
Noda Engineering Co., Ltd.

The Use of VR Simulation to Evaluate Safety of a New Type of Road (2+1) as well as Drivers' Behavior
University of Seoul

11th 3D VR Simulation Contest by UC-win/Road

Date : 19-Nov-2012 Location : http://vrcon.forum8.jp

GRAND PRIX

Project for sharing system of compact EV vehicle using VR simulation
TOYOTA Motor Corporation.

EXCELLENCE AWARD

Simulation for a landscaping plan using point cloud data
Kyushu-orient Servey& Design Co., Ltd.

Training system for tunnel administrator via VR
BMIA (France)

IDEA AWARD

Restoring the Oomuta street car in 1952 and the town along its railroad
Keisuke Ijiri

ESSENCE AWARD

Simulation for urban planning in front of Hokuriku Shinkansen "Iiyama station"
Iiyama city Construction channel department City planning section/ Section for maintening the surrounding of the station of Shinkansen bullet train

HONORABLE JUDGE AWARD

Regional Construction／Development／Accountability

Aiming for "Alleviating traffic jams in the original route especially near railroad crossings and narrow bridges".
Nishitetsu C.E. Consultant Co., Ltd

Experience simulator for ITS spot service
JEITA (Japan Electronics and Information Technology Industries Association) Car Electronics Commitee / Car Electronics Promoting Comitee

Simplified assessment for landslide extraction in the south of Nakatsuna
Material Hakuba Co., Ltd.

10th 3D VR Simulation Contest by UC-win/Road

Date : 15-Nov-2011 Location : :http://vrcon.forum8.jp

GRAND PRIX

System for checking the position where equipments are installed
Japan Railway Construction, Transport and Technology Agency

EXCELLENCE AWARD

VICS Driving simulator
Vehicle Information and Communication System Center

IDEA AWARD

Kamen Rider, cyclone racing simulator
TOEI Company, Ltd

ESSENCE AWARD

ITS driving simulator
Amlux TOYOTA Co., Ltd

DEVELOPMENT AWARD

Bicycle simulator
Graduate school of University of Tokushima

HONORABLE JUDGE AWARD

Regional Construction／Design／Good Communication

Simulation for improving the route taken by students going to and from school
Tatsumi Architects & Engineers

3D VR modeling of the Hunter Expressway
Roads and Traffic Authority of NSW (RTA)

VR simulation for consensus creation in the traffic nodes improvement project
Asahi Sokuryo Sekkei Co., Ltd

9th 3D VR Simulation Contest by UC-win/Road

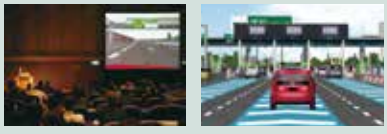
Date : 19-Nov-2010 Location : MEGURO GAJOEN

GRAND PRIX

Proposal of underground installation of Hanshin expressway and improved city using VR
Faculty of Policy Studies, Kansai University

EXCELLENCE AWARD

Highway driving simulator system
East Nippon Expressway Co., Ltd



IDEA AWARD

Debris avalanche simulation
Faculty of Engineering, Gunma University

ESSENCE AWARD

STRIDING AHEAD! ModelingUnpredictable PedestrianRoad Crossing Behavior
Abley Transportation Consultants Limited (New Zealand)

DEVELOPMENT AWARD

A publicity drive simulator for EV and charging system in SmartGrid
SK Energy Co., Ltd. (Korea)

HONORABLE JUDGE AWARD

Regional Construction／Design／Art

VR simulation of the crosswalk construction planning for the prevention of traffic accidents
Korea Transportation Safety Authority(Korea)

VR utilization for consensus-building toward landscape formation of design city, Kobe
Directorate general for Kobe city planning

VR simulation for the proposal of the ground facilities construction
Asunaro Aoki Construction Co., Ltd

8th 3D VR Simulation Contest by UC-win/Road

Date : 20-Nov-2009 Location : Tokyo Conference Center in Shinagawa

GRAND PRIX

VR Data for Ohashi Junction of Metropolitan Expressway
Metropolitan Expressway Company Limited


EXCELLENCE AWARD

VR simulation of Design Change of Korea Namhae Highway
Korea Road Agency (Korea)


IDEA AWARD

Simulation of Railway Bridge Beam Construction Work
Noda Engineering Co., Ltd.

ESSENCE AWARD

Simulation of Traffic in Kyoto City
Graduate School of Informatics Kyoto University

OVERSEA'S AWARD

VR Data of Roundabouts in US 41 Project
Ourston Roundabout Engineering, Inc.（USA）

HONORABLE JUDGE AWARD Regional Construction／Design／Art

Proposal of Reproducing Environmentally-friendly Waterland City Hino
Hosei University

VR Project of Beijing Guomian Group (Jingmian Second Factory)
Beijing Water Cube Digital Technology Co.,Ltd. (China)

Creation of Road Which Is Suitable for Aso Kuju National Park
Nishitetsu C.E.Consultant Co.,Ltd

7th 3D VR Simulation Contest by UC-win/Road

Date : 20-Nov-2008 Location : Tokyo Conference Center in Shinagawa

GRAND PRIX

Simulated driving diagnosis system using CG simulation
National Agency for Automotive Safety & Victims' Aid


EXCELLENCE AWARD

Sakai City Oshoji LRT Project VR data
Osaka University, Graduate School of Engineering, Division of Sustainable Energy and Environmental Engineering

IDEA AWARD

Erection of construction girders for underground passageway construction in train stations.
Noda Engineering Co., Ltd.

ESSENCE AWARD

VR utilization case in educational curriculum
Daido Institute of Technology, Department of Civil Engineering and Environmental Design

OVERSEA'S AWARD

AFRICA_SUDAN Project
CION Media Company (Turkey)

HONORABLE JUDGE AWARD Regional Construction／Design／Artistic

Sancheong-Sudong VR Simulation
Busan Regional Construction & Management Office (Korea)

Simulation of an evacuation in an aging society using 3D VR
Taisei Engineering Co., Ltd.

Digital Phoenix Project by UC-win/Road III
Arizona State University （USA）

6th 3D VR Simulation Contest by UC-win/Road

Date : 21-Nov-2007 Location : Tokyo Conference Center in Shinagawa

GRAND PRIX

Ishikawa-cho Junction Simulation
Kanagawa Construction Bureau, Metropolitan Expressway Company Limited

EXCELLENCE AWARD

SMARTWAY 2007 VR Simulation
National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure and Transport / Highway Industry Development Organization

IDEA AWARD

Driving Ability Measurement for Senior Citizen VR Simulation
Meijo University, Faculty of Science and Technology, Department of Information Engineering

ESSENCE AWARD

Asuke By-pass Road Simulation
Meishi Road Bureau, Chubu Regional Bureau, Ministry of Land, Infrastructure and Transport

OVERSEA'S AWARD

Qingdao JiaoZhou bay Tunnel Project
Nepoch Consultant Co., Ltd.

HONORABLE JUDGE AWARD Regional Construction／Design／Art

Katsunuma Station Square Park Simulation
Huyo architect office Co., Ltd.

Digital Phoenix Project by UC-win/Road II
Arizona State University

Hosei University around Ichigaya Campus VR Simulation
Civil and Environmental Engineering , Faculty of Engineering and Design, Hosei University.

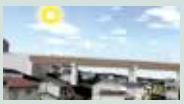
5th 3D VR Simulation Contest by UC-win/Road

Date : 27-Nov-2006 Location : Tokyo Conference Center in Shinagawa

GRAND PRIX

Simulation carried out at the Daishi junction and ventilation place
Kanagawa Construction Bureau, Metropolitan Expressway Company Limited

EXCELLENCE AWARD



Machida city, Aibara -Tsuruma line simulation
Bureau of Construction Tokyo Metropolitan Government Minami Tama Higashibu Construction Office/Japan Bridge & Structure Institute, Inc.

IDEA AWARD

The Simulation of Ecological Restoration of Yunnan Province Erhai Lakeside Area
China Shanghai Institute of Waterways

ESSENCE AWARD

The VR simulation for the landscape comparison of International avenue transit mall
Nihon University College of Science and Technology Department of Transportation Engineering and Socio-Technology

OVERSEA'S AWARD

2010, Shanghai international exhibition central axis simulation
China Nepoch Consultant Co. Ltd

4th 3D VR Simulation Contest by UC-win/Road

Date : 22-Nov-2005 Location : Nakameguro GT Tower Plaza Hall, Tokyo

GRAND PRIX

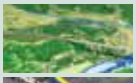
Matsuyama belt highway
Ministry of Land, Infrastructure and Transport, Shikoku Regional Development Bureau, Matsuyama Rivers and National Highway Bureau

EXCELLENCE AWARD

China : Tientsin Haihe bridges project - Cifeng bridge design study
CRISEN TECHNOLOGY CO., LTD.

OVERSEA'S AWARD

Korea : Dong Hong Cheun - Yang Yang highway project.
Korea Highway Corporation Basis Soft,Inc



IDEA AWARD

Metropolitan underground infrastructure model
NISSEI EBLO INC.

3rd 3D VR Simulation Contest by UC-win/Road

Date : 12-Nov-2004 Location : Nakameguro GT Tower Plaza Hall, Tokyo

GRAND PRIX IDEA AWARD CREATIVE AWARD

Road Management Support System by using Virtual Reality(VR)
Road Management Technology Center

EXCELLENCE AWARD

Landscape simulation for street planning
Metropolitan Expressway Company, Tokyo Building Bureau, Related Street Division

Ken-Ou-Dou (Chiba) VR simulation
Japan Highway Public Corp.,Tokyo Construction Bereau, Chiba Construction Office/Daiichi Fukken

2nd 3D VR Simulation Contest by UC-win/Road

Date : 1-Nov-2003 Location:Phoenix Seagaia Resort, Miyazaki

GRAND PRIX

Sagami Longitudinal Expressway Ebina Nirth JCT/CG Model
Central Nippon Expressway Company Limited Tokyo office, Atsugi work office

EXCELLENCE AWARD

Route1 Hokusei Bypass
Ministry of Land, Infrastructure and Transport, Chubu Regional Bureau, Hokusei National Highway Office

CG model of Fuji Speedway
Taisei Corporation Fuji International Speedway Co., Ltd

Simulation for the street improvement project in Otsu city
Yachiyo Engineering Co., Ltd Osaka branch office

Hill-crest in eastern area, HSST
Bellwood Design System Co., Ltd

1st 3D VR Simulation Contest by UC-win/Road

Date : 7-Nov-2002 Location:FORUM8 Tokyo head office

GRAND PRIX

Tokai Ring Expressway
Ministry of Land, Infrastructure and Transport, Chubu Regional Bureau, Tajimi Office of Sabo and national Highway

EXCELLENCE AWARD

Kushimoto bridge and Miyuga loop bridge
Nippon Koei Co., Ltd Osaka branch office

Construction work of train station's roof
East Japan Railway Company Research & Development Center of JR East Group

Presentation document on temporary construction in traffic intersection
Toda Corporation

Atsugi IC,Tomei Expressway
NEXCO Central (Central Nippon Expressway Co., Ltd Atsugi office of Tokyo branch)

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